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A MEDICAL HANDBOOK,

COMPREHENDING SUCH INFORMATION ON MEDICAL AND SANITARY SUBJECTS AS IS DESIRABLE IN EDUCATED PERSONS.

WITH

Hints to Clergymen and Visitors of the Poor.

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PREFACE.

The object of this little work is so distinctly set forth in the title-page, that further explanation or apology seems scarcely necessary. I make no pretence to enable any person to dispense with the aid of a competent medical adviser in any disease of importance. It is, however, the aim of every true physician and man of science to teach others how, by a careful attention to the requisites of healthy life, they may as far as possible postpone the day of pressing danger. In the first part of this work, those conditions of health are dwelt upon, under the successive heads of Light, Heat, Air, Water, Food, and Exercise. A man must feel less compunction in calling in the doctor when he knows that he has not himself to blame for those perilous bodily sensations which put him in fear of death.

In the second part of the work I have devoted my attention to that business of the restoration of health,

that science of disease and remedies, which is considered rightly to be the especial province of the medical man. I have put together, in as plain and simple language as possible, the result of our knowledge of this subject, in an Index of Diseases, and an Index of Remedies, both arranged alphabetically. Some may consider presumptuous, and almost dangerous, this attempt to admit the outside world within the portal even of the temple of medical mysteries. I dissent altogether from their view of the matter. Not only may it be urged that the knowledge which cannot be communicated is hardly worth preserving, and that secrecy and reticence on such important topics may serve the cause of quackery, but not that of true science; it may further be maintained that the physician or surgeon has a direct interest in the amount of correct information possessed by his patient and those around the sick man. The more they know about the state of the case, and the remedies that experience has shown to be beneficial in similar attacks, the more intelligent the co-operation which they will be able to render to the medical man, the less their surprise at the issue, or their proneness to ideal terrors. The skilled adviser cannot be always present; and I

will make bold to affirm that, unless the sick man or those about him know something of medicine, the treatment will be, in most cases, a game of chance. Men now-a-days study divinity, without being thought to trench on the sphere of the clergyman. To know something of the principles of law is a part of the education of a gentleman. Surely it is also of importance that the casualties to which the weak human body is subject, should receive some share of the attention of those whose comfort is threatened by them, whose career they may suddenly bring to an untimely close. It is with this conviction that I seek to teach the rudiments of medicine, speaking only to educated persons, and in language comprehensible by them.

There are occasions so trifling that medical help is unnecessary; there are seizures so sudden that this help may not arrive in time. In such this simple knowledge may prove eminently useful.

The poor, more than the rich, are at the mercy of disease, for they have not at hand the necessary appliances in time of danger, nor can they always command the requisite medical attendance. The parish officer is often so overtaxed by his attentions to serious cases that he has scant opportunity of

befriending those whose ailments are common and trifling. The Rector, the Curate, the District Visitor, may have it in his power to give to many that salutary advice which may be the means of preserving health or relieving bodily affliction. If sufficiently instructed to do so, he may add this power of doing good to those other qualifications which fit him to be the friend of those who are tempted to think, in their sore time of need, that all the world is against them. This important end, of rightly instructing those who are specially called upon, by their position, to be the advisers of the poor, I have held constantly in view.

MEDICAL HANDBOOK.

PART I.

ON THE PRESERVATION OF HEALTH.

Most men wish to live. Every one, except the desperate, has a natural objection to dying before his time. Yet many, and perhaps the majority, do so. The days of man's life, we are told, are threescore years and ten, and, by reason of strength, he may reach to fourscore years. But few amongst us attain to this good old age. "Few and evil"—few, because evil—"are the days of our pilgrimage." By close and foul air, unwholesome food, insufficient light, want of natural exercise, over exertion of body or mind, indulgence in dissipation, the faults of his parents or his own, the life of many a man is shortened, which might, had it lasted, have been a

source of happiness to himself, of advantage to those near him, of indirect profit to the whole community. Yet I do not think that many arguments can be needed to enforce upon my readers the necessity of paying some attention to those rules by which life and health may be prolonged. If there be some who are so reckless that they will not regard them, it is more than ever the duty of others to study them for their own good and that of the rest.

The science of health is a science with which all should aim to be acquainted. There are some whose vocation it is to make it their especial study. But it is far too common a habit among men to delegate to the physician, or medical man, the sole and undivided control over matters of such momentous importance. When the mischief which has sapped the foundations of life is in its birth, few think of appealing to him, as few can foresee what the probable issue will be. His aid is commonly invoked in extraordinary cases, when death is on the very threshold. He has too much on his hands to be an adviser in every family—a constant and watchful friend at every fireside. He is consulted in a pressing danger that might well have been averted by timely means. His patient is eaten up by scrofula, or wasted with fever, it may be; it is too late now to restore him to life and health. He knows of the close rooms, the dark bedchambers, the noxious emanations that tainted the air, the excesses that

undermined the constitution. Had these been attended to in time, all might have been well. The physician can only advise; his advice must be followed by those who intelligently appreciate his meaning. He may superintend and direct the treatment of the sick; to carry out his directions with all the necessary minuteness demands some knowledge on the part of those who are about the sick man.

The science of the Preservation of Health is commonly called Hygiene; also Sanitary Science. The first word refers more especially to individuals, the latter to communities; but the principles are in all cases the same.

The following argument has been employed in illustration of the importance of this study. Many persons have reached the age of a hundred years—why should not all do so? There is no doubt that the average duration of human life may be, and has been of late years, prolonged by the attention that has been paid to sanitary matters. Many deaths—indeed, a large percentage of the whole—arise from causes which are accidental, and, therefore, removable. For example, the mortality of infants in towns was calculated a few years since to be twice as great as that of infants in the country. There must be some cause connected with the circumstances of our life in towns, some cause which should be attended to and, if possible, removed, to account for so great a disparity. At the same time, the mortality of

adults in towns compared to that of adults in healthy country districts was as twenty-four to seventeen.[7] More persons died annually in London from a neglect of the laws of health than fell in the Battle of Waterloo.[8] This is not the case now. And to show that this fatality of town life is not inevitable, it is sufficient to state that by the improved drainage, other sanitary measures, and spread of public enlightenment of late years, the mortality of London has diminished from twenty-four to about twenty in every thousand annually![9] In the town of Liverpool, after an improved method of drainage carried out by the Corporation, and the shutting-up of the underground cellars in which many of the poor resided, it was calculated that the lives of 3,750 citizens were saved in one year to the community.[10] Thanks to the advance of knowledge and hygienic science, the mortality from epidemics is now far less than it used to be, and the deaths from consumption are rarer.[11]

Many great discoveries have been made in the science of medicine. We have preventive means against small-pox, scrofula, consumption, which avail us far better than our old attempts at cure when the disease had got the mastery. Much has been done, too, in the direction of wholesome food, pure water, cleanliness, exercise, acknowledged to be matters of vital necessity to all. In one point, perhaps, instructed by our insight into physiology—

the laws of life—we have done most good of all. We have endeavoured to impress upon men the paramount importance of pure air, as the first necessary of life.

In treating of the Preservation of Health, I propose to enter briefly on the consideration of those various simple conditions or agencies on which our life depends. These are light, heat, air, water, and food. The proper care of this body of ours consists mainly in a fit regard to the effects of these agents upon it. All of the five are equally necessary to it. I say equally, because without any one of them it would be absolutely impossible to live. We are taught this already by our instincts. Every man, woman, and child contrives to live, though often in an indifferent manner. And it is only by maintaining the body at its due temperature, by exposing it sometimes to the light of heaven, by allowing the air to surround and enter it, by its drinking water, and partaking of solid food, that the frail machine can be kept in any sort of working order. But it is emphatically on the regulation of these elements, on the maintenance or constant supply of the right amount, at the right time, of these essentials of existence, that the state of body called health depends. Too little light or heat will cause disease, too much light possibly, too much heat certainly. It is hard, perhaps altogether impossible, to have

too much air; but the having too little is, doubtless, the most fruitful of all the causes of disease. Too little food causes disease by insufficient nutrition, or death by starvation; too much, disorder by repletion. The right kind of food, and the right time of taking it, are also matters of the greatest moment.

Connected with these laws of health are matters which, though they may not regard the essentials of life, yet relate to things most important to our well-being. Chief of these is the comprehensive question of the exercise of body and mind. Without use their machinery would grow rusty, and fall to decay; and this use that we put it to must not be excessive or ill-judged; the right apportionment is the very soul and foundation of education as connected with the theory of health.

It may be said, and with truth, that these things are trite; or that, because everybody knows them, they may as well be taken for granted. But, in the first place, I differ from those writers who urge the uselessness of repeating trite sayings. Somebody must repeat them, or they would before long cease altogether to be accepted as truths. And, further, it is because I wish to push these truths to their inevitable and practical consequences that I begin like the mathematician who assures us, at his starting-point, that two and two make four, and a straight line is the shortest distance between two points. Our syllogisms are strengthened by the fact

that every one admits the premisses. I know, says some one, that light is necessary to existence. Then remember to give yourself enough of it, and your children too. I admit that we cannot live without air; every school-boy is taught that. And yet you sit in-doors all day with your windows closed, and that great back-door never turns on its rusty hinges. Let that wonderful schoolboy, with his store of universal knowledge, have sometimes a little change in that stifling school-room atmosphere, where knowledge is pursued under difficulties that none but a schoolboy's constitution could struggle with successfully! And so, to cut it short, I am going to say just one more trite thing, which is, that there is sometimes a wide gulf between theory and practice.

LIGHT.

The phenomenon called light is more easily felt than described. It is attributed by philosophers to a series of vibrations, immensely rapid, taking place in an imponderable fluid which pervades all space. The central source of light to us is the sun. From that body it radiates in all directions, at the rate of 192,000 miles in a second of time. To appreciate this velocity we may remember that the vibrations of sound travel only at the rate of 1,000 feet in the second. Light is to us intelligence and sense. In a total darkness we should be, as it were, ignorant of all things. By the reflection of light from the bodies

on which it falls, we are rendered cognisant of all things external to ourselves. From the bodies on which they strike, its rays pass through the pupil of the eye to the sensitive nervous expansion called the *retina,* which communicates directly with the brain. But the vibrations which constitute common white light are not simple and uniform in their nature. They consist of several distinct series, occurring side by side, and blending together. Of this we are made aware by the phenomenon called refraction. When the ray of the sun passes obliquely from the air into a denser transparent body, such as glass, it is bent, or refracted, towards the line perpendicular to the surface. But the parts of which it is composed are not refracted to an equal extent. The compound ray is split into seven rays of different colours, which are in this order—red, orange, yellow, green, blue, indigo, and violet. A prism of glass produces this decomposition, and the rays which issue from it constitute the "prismatic spectrum." This fact was discovered by Newton, who showed that the rays thus divided, when passed through a second prism in an opposite position to the first, were reunited into white light. The colours of various bodies are explained by the absorption by a coloured substance of the parts of the ray supplementary to the colour exhibited. A red body reflects the red ray, and absorbs all the others; a green body reflects green only; a white reflects all; a black absorbs all; and

so on." This matter would be of little interest to us in a medical point of view, were it not for the discovery of the important fact that in the solar ray there are bound up certain parts which favour chemical changes." These chemical rays are invisible to the eye, and, when the refractive decomposition occurs, they are beyond the violet ray, at the extreme end of the spectrum.

The coloured rays of light are essential to our enjoyment of life. Without them we should feel our way about like a blind man, knowing nothing of the objects around us but by the four slow senses of touch, hearing, taste, and smell. Our experience of creation would be limited to those things that are in our immediate neighbourhood. Were all alike in this respect we should be slow in our discoveries, imperfect in our sympathies, and little better off than the dead. Thus utterly isolated should we become by the absence of visible light, or the want of the sense of sight which enables us to perceive it.

But the chemical rays of light, though inappreciable to sense, are far more essential than the others to life and health. In artificial light, produced by the process of combustion, they do not exist to any extent. They abound in the rays of the sun. The photographer, who needs the chemical rays which work for him in reducing the compounds of silver, can do nothing by gas or candle light. Now there are certain changes in the animal, and also in the

vegetable organism, which can only take place properly under the influence of the same chemical rays which produce this deoxidation of the silver compound. The formation of the red colouring matter of the blood of animals is one of these processes. Without the due formation of these red particles of blood animals waste and die. The green colour of plants is fostered by the selfsame influence. Plants grow white and sickly in the dark; animals do the same.

"The longer a man lives in darkness, or in artificial light, the less in the light of the sun, the scantier will be the red colour in his blood." As the globules in which this red colour resides are necessary to nutrition, growth, and health, it follows that when a man is exposed to an insufficient amount of light, he becomes sickly and wasted. Existing in constant darkness, if that were possible, he would die. The wretched blanched creatures who pass a great part of their lives in mines below the surface of the earth, are an evidence of this fact. The pale emaciated beings who work in the cellars and ill-lighted dwellings of our towns bear a mournful witness to the evils which arise from an insufficiency of light. If we are to live indoors for so great a part of our lives, let us at least have plenty of windows where the rays of the sun may find entrance. Let us congratulate ourselves that the window-tax, the tax upon life, the wickedest and

cruelest of imposts, has been abolished in our day, that our rulers no longer resort, for the sinews of Government, to the encouragement of disease and death. Most Malthusian and philosophic of imposts was that window-tax. It put an effectual stop to an excessive increase of population; marriages might be very frequent, but the births only filled the churchyard, when the young had no light by which to grow. To the lamentable deficiency of windows, which will still be observed in our towns until the present generation of houses has rotted away, we must add the narrowness of streets as a cause of deficient light. To save valuable ground was thought far more important than to preserve a life which this short-sighted prudence might endanger. Putting aside philanthropic considerations, a sounder economic theory has taught us at last that the conservation and prolongation of individual lives is of paramount importance to the community at large. Each man, each woman, is a productive engine, from whose labours all others derive advantage. Place that man, or that woman, in disadvantageous circumstances, or an unhealthy locality, you drive him to the gin-shop and the workhouse: you make him a burden to society instead of a benefit. I trust soon to see the day when the construction of the dwellings of the poorer classes will be found a matter worthy of the careful attention of all, instead of being confined,

as now, to the efforts of isolated philanthropists, few and powerless. Give them enough light, give them enough air, give them only comfort in their houses, and you will make them true men and women whom now you do your very best to keep down to the status of reptiles.

Nor is the life of the higher classes, in the aristocratic and well-built quarters of towns, at all free from this degenerating incubus of an insufficiency of light. Compare the rich townsman with the agricultural labourer, the ball-room belle with the milk-maid. The difference between these pallid complexions and enervated frames, these ruddy faces and sturdy thews, is so observable that it has passed into a proverb. Now, as a general rule, the weakly citizen is incomparably better fed, and, on the whole, much better cared for than the stronger rustic. The advantage of the latter lies simply in his better supply of those first essentials of health, light and air. As many of us must live in towns for the greater part of our days, as the number of townsmen becomes constantly greater in comparison, it behoves us seriously to consider how we may atone for this disadvantage, and procure ourselves a reasonable prospect of that health which we should obtain by that residence in the country which we find incompatible with our duties. We shall do this best and most simply by spending as much as we can of the day in the open air. Man was not meant to pass his

life in confinement, or even under cover. While he does so he should provide himself with air by means of doors and windows. This is comparatively easy. To get enough light is more difficult. Nature intended that he should be constantly exposed to the rays of the sun for just as long a time as those rays are shining. If he cannot be constantly out of doors, the next best thing is to obtain as much light as possible in the construction of his dwelling. But here we find another most potent cause of unhealthiness in the bad habits which have grown with our modern civilization. Man was meant to rest during the period of darkness, to be awake during the period of sunlight. Animals of lower grade obey this law, and he is, by his nature, subject to the same; but, by a singular perversity of mind, he has chosen to turn his morning into night, and to prolong his day far into the darkness. If the world could all be put back six hours, the sunlight would illumine the evenings when we light up with oil and gas. Our days being rendered natural, our lives would be prolonged; we should cease to waste our substance in the aping of God's free gift, and the cheerfulness which accompanies sunlight would be added to our stock of happiness, too slender to be wilfully diminished. The world is too foolish to be mended; we must fain sail with the stream, and take things as we find them. But we must not count on living long on such a system as this. Sun-

light is a necessary of life, and it is here that the countryman has so great an advantage over us. He is whistling at the plough while we are sleeping an unhealthy sleep, disturbed by the intrusive sunbeams which will, somehow or another, find entry into the darkened chamber. He is plunged in a happy oblivion while we are trifling in the close assembly-room, beneath the glare of gas, or tasking weary brain and trembling hand in the glimmer of the midnight lamp. If man will thus fly in the very face of nature, what can he expect but to reap the consequence of his folly? "Early to bed, and early to rise," may not make a man "wealthy" so long as the habits of the world are at variance with this usage. It may not, in our modern sense, at least, make him "wise" whose tortured and ill-directed brain finds solitude essential to study. But make him "healthy" it certainly will, if he be anyhow capable of health.

The general lesson that I wish to urge here is simple and definite. Man has need of light; it is good for his body and for his mind. The natural colour and texture of the one, the natural cheerfulness of the other, are alike fostered by it. Light is actually an encouragement of virtue, and obnoxious to the bad. Vices are really, as well as metaphorically, deeds of darkness. Open out that foul court, and throw the sunlight into its rooms, and the bats and owls that frequent it, though they blink a little

at the first, will be shamed into a better life by the sight of that heaven to which they have been so unaccustomed. By placing our houses in open and free situations, not too close together, by providing them with abundance of windows, which must seldom be darkened, we who are obliged to stay in doors for a great part of our time do our best to get that sunlight that we else should miss. The glare of the rays at mid-day may be diffused and mitigated by a white blind, not too closely drawn. Coloured blinds are prejudicial, as we need the whole ray of light, and they stop a part of it on the way. Verandahs, wooden sun-blinds, Venetian blinds, shutters, and all the various contrivances for saving our carpets, and making our houses wretched, are a perfect abomination in an inhabited room, except where the sun's ray is so fierce that it cannot possibly be borne. Difference of climate and circumstance should be kept in mind. A verandah that, in Florence, is a necessary of life, is an anomaly in our northern latitude; a Venetian shutter that saves the eyes from the glare of the white sea-front at Brighton, is scarcely wanted to intercept the few straggling rays that penetrate obliquely the mists of a London street.

Let us always remember, then, to get as much light as we can. Let those who can expose themselves frequently in the open air. Sickly children, at all events, can hardly be out of doors too much.

There cannot be a more fatal mistake than keeping them at home when not positively ill, and there is hardly a day in the year when an opportunity cannot be found. Let persons who sit indoors sit near the window by preference. Take down those blank brick walls, cut down those trees even that shut out the daylight from your villa. Let the clerk or the student turn his face towards the light as he sits at his desk.

Even during the night the natural darkness should suffice for us, and we need not take such pains to shut out the morning sun from our bedroom windows. Some chambers are so studiously darkened that they resemble graves rather than bedrooms, and make sleep seem more like death than it is in reality. That sleep cannot surely be healthy which is fostered by such artificial means. Supposing a house to face east and west, we shall do well, in building it, to arrange it so that the bedrooms shall have an eastern, the sitting-rooms a westerly aspect. We shall thus have, for a great part of the year, the advantage of both the rising and the setting sun.

Sick persons should never be deprived of light, except in cases where it is positively painful to them, or where the exciting effect on the brain is feared by the physician.

Of all rooms in our house the nursery should, if possible, be the lightest and brightest. The growing little ones need the light most of all. Their frames

are forming, their minds are developing, both needing every healthy stimulus that we can give them. Confinement in dark rooms is a system of slow murder for them, nothing more or less. What gardener would think of denying the young plants in his greenhouse the light of heaven? In the long white shoots of sea-kale and celery he obtains the results of the dark system of education. And the puny, vicious boy, the maudlin, hysterical girl, are the inevitable corollaries of a mistaken system of nurture, of which the deprivation of light is one of the most radical faults.

It is a question how far persons who complain of weak eyes should be humoured in their preference of darkness and shade. For myself, I think it far better that they should protect themselves from suffering by wearing spectacles of a neutral tint, or even a shade over the eyes, than avoid the sunlight, so doing hurt to both body and mind.

The question of the aid afforded to defective vision by spectacles, or glass lenses, the employment, I mean, of convex glasses for far-sighted, concave ones for short-sighted persons, being almost beyond my present province, and a matter which is tolerably obvious in itself, I merely allude to it in passing, as being connected with the subject of light. Young persons should never be allowed to wear spectacles unless positively helpless without them; for the imperfections of the eye in youth will generally

mend as life advances, whereas the effect of these artificial helps is to render such faults permanent.

Much might be said of the influence of colours on health. As the invisible or chemical part of the ray of light is the part which most promotes the health of the body, so the coloured or visible parts are those which, being brought into relation with the mind through the sense of vision, inform it of all things, and constitute a necessary element of its happiness and equilibrium. Of colours, white, which is the combination of all, is the most cheerful, and therefore the most healthy. But when receiving the direct rays of the sun, a white surface, which reflects them all, is too glaring to be agreeable. Light colours are pleasant, because approaching to white; dark are melancholy, because black is the negative of light—darkness. The colours of the spectrum have all more or less a charm for the eye, but their effect is various. Red is exciting; green is soothing, and is, therefore, the colour of nature in her most agreeable aspect; brown is sombre, and unsuggestive; black expresses mourning and misery. For the papering of a room, I suppose that tints approaching to white, but not absolutely white, are the best. A narrow bordering of some gayer (say primary) colour will please without dazzling the eye. Of colours, next to the whitish ones, green is perhaps the best. Dark tints should be avoided. Of the mixed colours in a sitting-room, that combina-

tion should be selected which is pleasing to the educated taste, and cheerful without being exciting. Different tints of the same colour should not be contrasted, as the effect is painful. Colours complementary to each other, as red and green, or yellow and violet, may be placed in juxtaposition, but should be in such a proportion as if put together would make white light. If two of the primary colours (red, blue, yellow) are placed together, the third should be present also, by the same rule. Black and white, being indifferent, may be associated with any colours of a positive kind. Black accords well with reds and yellows, and white with blues. These rules, though belonging to what are called matters of taste, yet depend all on the fundamental philosophical laws which determine the hues of nature, and render the combinations of colour which constitute white light most agreeable to the eye and to the mind.

HEAT.

The condition called heat is ascribed by philosophers to a series of vibrations taking place in an imponderable medium, differing from those of light both in kind and degree. Without theorizing at all upon the subject, it is sufficient that we all understand what is meant by the word. Heat is appreciated by the sense of touch, light by that of sight. Both have this point of resemblance, that they have

their chief source in the sun, from which point they radiate to our planet, as well as into the rest of space. But while light is only an occasional necessary of life, so that being deprived of it for a time we do not die, heat is constantly necessary, and a fundamental condition of the act of existence. When deprived of the rays of the sun, we have other causes at work which supply us with heat. For without heat, if only for a single moment, an animal would die. A temperature of from 98 to 100 degrees of the thermometer of Fahrenheit is necessary to human life, and to that of most warm-blooded animals. This temperature of the body must continue the same, whatever may be the heat of the atmosphere around it. The law of heat is such that by conduction from one to another all substances have a strong tendency to become equal in temperature with those which surround them. Thus a dead body becomes soon of the same temperature as the external air. It is otherwise with living animals. The body of a man, while he lives, must continue at the temperature of 98°, whatever the heat of the air. Now as the heat of the air is generally below this point, in what manner is this heat of the body kept up? The answer is simple. Combustion, or burning, is a process which consists in the combination of organic substances with oxygen. This process produces heat. In the burning of a coal or wood fire, of gas, of tallow or wax, it takes place rapidly,

with the evolution of light as well as heat. But, under other circumstances, it may occur more slowly, when heat is produced without light. By such a slow combustion the heat of the animal body is kept up constantly to the requisite point.

External heat and cold only affect the surface of the body, and that but slightly. When the air which surrounds us is below 98°, as commonly happens, this requisite temperature is kept up by a combustion or oxidation of certain materials within us, which goes on by the aid of the lungs. Combustion and oxidation are here synonymous terms. The process demands two things. The first is the fuel, the matter to be burnt or oxidized; the second is the oxygen gas which has to combine with it. The fuel consists of organic compounds, rich in carbon (charcoal) and hydrogen. Such compounds are starches, sugars, fats, and oils. They are contained in the blood which permeates the minute vessels, which form a network beneath the delicate membrane which lines the lungs. By the process of breathing these matters are brought into continual contact with air. Air contains oxygen gas. Combining with the carbon of these combustible elements, the oxygen produces carbonic acid, an oxide of carbon (CO_2). Combining with their hydrogen it forms water, an oxide of hydrogen (HO). Carbonic acid, thus produced, is a gas. The water, thus formed, is partly vapourized at once. So that oxygen enters into the

lungs with the air inspired, and the air expired, or breathed out, contains carbonic acid and the vapour of water. And this oxidation produces heat. It is only by such a constant slow combustion of oxidable elements that the heat of the body is maintained. It is only by heat that the animal functions can go on; *heat is necessary to the proper action of the nerves and the muscles of the animal—in a word, to its life. The carbonic acid and the water that we breathe out involve so much loss of solid matter to the system.* One great reason why we must take food is that this constant loss may be supplied. A starving animal must have his bodily heat supplied somehow; he lives upon his own substance, his tissues are gradually burnt up, and so he wastes and dies.

Thus a great part of the food that we take is necessary for the maintenance of what is called the animal heat. The rest of the food makes up for the daily loss incurred by the waste of the tissues. The articles of our food which are burnt to keep up the temperature of the body are called calorifacient, or heat-producing elements. Starchy and fatty matters both serve this end. The matters which contain nitrogen, as meat, and the gluten of bread, are called nutritive elements, because out of them are formed our flesh and other tissues. If a man feeds on these alone, some part of them must be burnt and wasted; if he does not eat at all, the tissues of his body must be oxidized, to support the degree of temperature

which is necessary to existence. The products resulting from combustion must be got rid of somehow from the body. And the oxidation of nitrogenous bodies is attended with this disadvantage, that compounds result from it far more complex in their nature than carbonic acid and water, and far less easy to be got rid of. Carbonic acid and water are rejected by the lungs, the same organs by which oxygen enters.

The disadvantage under which I labour in this brief attempt at explaining a very intricate process is, that those who understand it may think my remarks superfluous, and those who do not understand it may consider them insufficient and meagre. But it will be enough if I succeed in impressing upon these latter these fundamental truths, that a high degree of heat is essential to the life of an animal; that this heat is maintained by a process of slow combustion, a combination between the oxygen contained in the air which we breathe and certain carbonaceous matters, contained in the blood, with which that oxygen comes in contact; that these matters are derived, as a rule, from the daily food that we eat, and consist mainly of the starchy part of bread, and the fats and oils contained in animal and vegetable food.

Of the quantity of food that we require for this and other purposes I shall have to speak directly. The precise nature of the exchange between oxygen

The colder the climate in which a man lives, tl greater the demand upon the source of heat with him. The Esquimaux at the Arctic Pole, where tl temperature is often so low (—40°) that the vei mercury freezes, and the naked savage of th equatorial zone, where the temperature may rang at 100°, have bodies of the same temperature The former obviously requires extraordinary mean for keeping up the heat; the latter, around whom is an atmosphere which may equal, if it do not surpass, the natural heat of his frame, makes but an inconsiderable demand on the heat-producing process. Thus, in cold climates, carbonaceous food is the one great thing needed. The Greenlander, who has few vegetable articles, and therefore little of the starchy element to resort to, devours fats and oils with an avidity that is surprising to us. The dweller in a warm climate needs much animal food to supply the waste of his tissues; but starches and fats are comparatively superfluous to him. So in the winter we need more bread, more oily food too; in the summer more meat in proportion. A plentiful supply of bread or heat-producing food is equivalent to so many blankets or greatcoats in saving us from being injuriously affected by the external cold.

Because the heat or cold of the atmosphere do not, and cannot, while we live, affect the temperature of the internal parts of the body, it would be very precipitate in us to assume at once that they have no effect upon us at all. The action of heat and cold upon us is manifest and unmistakeable. Heat causes a relaxation of our tissues, and produces at first excitement of the nerves and circulation, then languor and weakness of the whole system. Many causes combine in producing these results. The mechanical or direct effect of heat, which affects the superficial parts only, is to expand, and thus diminish the healthy tension of the tissues. By dilating the vessels of the skin it causes a flow of blood towards the surface. This flow, together with the stimulant effect on the superficial nerves, causes an excitement to be communicated to the heart, and the activity of the circulation to be increased, as we learn by the augmented rate of the pulse. But this excitement is succeeded by general weakness; there is a feeling of lassitude, with which the pulse becomes slower than usual, the stimulus being withdrawn. The perspiration, or secretion from the skin, is increased by external heat; not only because the veins of the surface are dilated, and the circulation through them promoted, but for another special reason. A natural law, which ordains that the proper heat of the living body can never be diminished by external influences, requires

also that it shall not, under any circumstances, be increased beyond the standard of 98°. So when the air outside is warmer than the body, the latter must be provided with the means of producing cold, so as to counteract the tendency to an augmentation of the temperature of the skin. Perspiration implies an *evaporation of fluid from the surface. Evaporation always produces cold;* and just as much cold is produced by this means as will serve to reduce the body to the natural standard. But excessive perspiration is always followed by exhaustion, so that here we have another cause of the languor produced by external heat. Another is found in the forced inactivity of that healthy process in the system by which the standard is maintained in ordinary conditions of the atmosphere.

Thus the general effect of heat is relaxing and weakening. Another result of heat is an increase of the waste of the body, and, consequently, of the various excretions. A kind of transmutation, a decay, in fact, goes on constantly in the muscles, nerves, and other tissues of the living animal, just as it does in the dead body. Only, in the dead body, in the putrid meat, they remain to impregnate and contaminate the whole mass. But, in the living, these lower and degraded products, some of which are offensive to the senses, all of which are useless to the organism, are separated by a vital process, and cast off by means of the organs of

excretion. In the urine, the sweat, and the alvine excretion, we find these lower forms of organic matter rejected as useless and noxious to life. This process of waste or decomposition goes on always. Our frames die piecemeal daily, while we ourselves, as a whole, go on living by continual restoration. *But heat promotes the decay of the living,* as it does *of the dead animal, and augments the due proportion of these excreted and effete matters.* And more food of the nitrogenous kind (nutritive) is needed to supply this waste, and over secretion. Thus we see explained the fact that we eat about as much in summer as we do in winter. In cold weather there is an extra demand for the calorifacient food, in warm weather for the nutritive articles of diet.

Heat, then, relaxes the tissues, increases the waste, and augments the excretions of an animal. Cold does the reverse, and for the opposite reasons. It braces the muscles and contracts the vessels by its mechanical action. If stimulation is produced by it, it is not immediate, but secondary, attending the reaction from the first frigorific effects. By discouraging organic decay, it tends to diminish the waste and excretions from the body. It retards the perspiration, which is a cause of weakness. It causes a demand for starchy diet (bread) in preference to nitrogenous food (flesh), for the reason just now stated. It promotes the vigour of the

system by exciting to full activity the respiratory or heat-producing function, which is necessary to resist its influence. But when excessive it overpowers this. The system fails to produce heat as fast as it is withdrawn, and *death occurs, preceded by a lethargy of the brain, and utter loss of power in the* muscles. Death caused by excessive heat is produced simply by an actual burning or destruction of the substance of the body. That produced by cold is more insidious. It is almost impossible in the vigorous, or those who arm themselves with the means of artificial protection at their command, and occurs only from an utter collapse of the natural power of resistance.

Man, in all ages of the world, has been accustomed to invest himself with artificial integuments. He has been defined as the only animal which cooks, and the only animal which laughs; he is also the only animal which, of its own will, wears clothing. Savages, especially those who inhabit tropical climates, do this to a less extent than civilized men, who inhabit chiefly the temperate zone. The natives of the north, though their educational standard is low enough, cover themselves with a thick coating of skins as a protection against the inclemency of the weather. So we may conclude that the habit of covering almost the whole body has no necessary connexion with refinement, nor even with the feeling called modesty, which is itself, to some extent, an

artificial thing, and the result of association and use (as the very word indicates). Clothing, in cold and temperate climates, is required as a protection against the weather; but in countries where it is only against *the heat of the sun that protection is needed, the object of clothing being entirely changed,* its mode or *fashion must change also.*

One reason why the European finds it difficult or impossible to live in a tropical clime is that he can seldom divest himself of his prejudice in favour of thick and tight-fitting garments. The habiliments that are necessary in England become preposterous when worn at the Equator. The soldier in his heavy uniform, the missionary in his black cloth coat, falls down beneath the burning sun, in whose light the native struts about undismayed. Where the heat of the air is above that of the body, the only possible use of clothing is to provide shade, to shut off, instead of to co-operate with, the rays of the sun. This object is attained by the bamboo hat of the Chinese or Malayan, by the blanket which the Indian casts loosely over his shoulders. It is a curious and instructive fact, that the mortality amongst the races of the South Sea has been immensely increased since their conversion to Christianity. So great is it, that it is supposed that in a short time these races will have disappeared altogether. The same is the case with the converted and civilized negroes of the west coast of Africa.

No one can presume to attribute any part of this fatality to the purer faith and more regular manners which have been taught them by the zealous missionaries. But I do partly ascribe it to the fact that some of these gentlemen, with more zeal than knowledge, have in times past induced their disciples to adopt the costume as well as the faith of the European. It is well that in the present day a better system prevails; but there is, I fear, still room for improvement. I should say that there can be no more melancholy spectacle than that of a sweltering assembly of black men arrayed in cloth coats and trousers, and of black women in stays and crinoline. Priceless as is the faith that the white man brings, the black, were he more of a philosopher, might think it bought too dearly if paid for with health and life, with the gradual but certain degradation and extinction of his race by the insidious introduction of this exotic system of clothing. He might even suspect their motive in thus attiring him, and receive them, could he speak Latin, with a "timeo Danaos ac dona ferentes." Few converts, I fear, have the strength of mind that was displayed by the African chieftain whom Dr. Livingstone furnished with a supply of European clothing, and whom Mr. Gordon Cumming, passing that way soon afterwards, found arrayed in the naked simplicity of a cocked hat and a pair of boots. The boots kept his feet from the prickles, the cocked hat his head

from the sun; and these were the only articles that were really of any practical use to him.

In a temperate climate, like that of England, there is just so much of struggle with the external cold as suffices to keep a man in robust health. This moderate heat of the external air, averaging from 60° to 70° Fahr., is thus conducive to health. The respiratory process keeps up the body easily to its excess of thirty or forty degrees above the surrounding medium. But a series of changes, of variation in the external heat, is essential almost to bodily vigour. Were the call upon the system for the supply of heat always uniform, the process would become monotonous, and wearisome by its sameness. When sometimes the demand is greater, sometimes less, the function is kept more in exercise. It is thus that a changeable climate is rendered a healthy stimulant to those whose bodily organization is capable of enduring its variety. Delicate and feeble frames are placed in danger by those very conditions which promote the hardihood and longevity of the rest of the species. Grumble at it as we may, it is certain that this variable climate of ours has somehow nurtured the hardiest, the most active, the most beautiful race that the world has ever seen. Whether it be its dampness, its vicissitudes of heat and cold, or its general salubrity owing to its freedom from great extremes—in some way or another, the climate of England has produced that kind of man which no

other atmosphere in the world can foster in like manner. Transplant the Englishman to America, he becomes meagre, short-lived, and incapable of physical endurance. Take him to Australia, South Africa, or any other of our colonies, and the quality of bone and muscle will deteriorate with each generation. The Anglo-Saxon may, as it is popularly said, be born to inherit the earth, and replenish distant continents; but the families nurtured in these islands of the Northern Sea will continue, it seems, to have a physical, and thus a moral, advantage over their distant cousins, and form the aristocracy of the race. The influence of climate over physical development and moral capacity is a fact which has been boldly disputed, but which history will probably assert without possibility of gainsay.

Clothing is, then, as we have seen, necessary, in order to assist the frame in its struggle with the external cold. In clothing ourselves, we interpose a number of non-conducting materials between our bodies and the air outside. This air, in a state of rest, is itself a bad conductor; but, being always in motion, it would rapidly exhaust the heat of our bodies, if exposed directly to its influence. The woollen and vegetable fabrics with which we cover ourselves conduct this heat but slowly. By increasing their thickness and substance, we arm ourselves yet more effectually against external cold. Animal fibre is a worse conductor than a fabric of cotton or

flax. Flannel worn next the skin is admirably conducive to health. In winter it secures the warmth produced within; in summer it absorbs the perspiration, which, if left unabsorbed, would produce sudden cold by evaporation. If flannel be not worn, cotton is better than linen, because a worse conductor and a better absorbent. Not only the texture but the colour of clothing is important. Black has a greater power of absorbing and of radiating heat than white. It thus makes a man hotter in summer, and colder in winter, than a light-coloured garment. Light colours in dress are conducive to health. But black is a fashionable thing for men, and often held becoming for women; and fashion and appearance will generally carry the day against physiology and reason.

But the most important point to be remembered with reference to clothing is that it should be accommodated to the variations of external temperature. Men and women who wear the same dress in summer as they do in winter neglect the very object of clothing, which is to protect us against external cold. When the weather is warmer, we should immediately dress more lightly; when it becomes colder, we should put on additional garments. Our dress out of doors always varies from our dress indoors by a hat or bonnet at least; in summer this will be enough. It is a good rule to put on a great coat or mantle when the ther-

mometer in the shade outside marks below 56°. Unless some such rule is adopted we shall be likely, in the popular phrase, to "catch cold" in our walk, especially if the healthy power of resistance should be casually disturbed. With our indoor life we have another way of protecting ourselves. In the summer the inside of our houses will be generally cooler than the outside, especially if properly ventilated. In the winter the same ventilation should be kept up, but the apartments will, nevertheless, be so much warmer than the air outside as to render unnecessary that clothing which we find essential in our walks. Still the heat of our house will not be sufficient without some artificial aid. It should generally be maintained to an average temperature of 70°. We may do this by open fires, by stoves, by pipes containing hot air or hot water. Stoves and hot pipes may be placed in the same category; they may produce heat, it is true, but they heat and dry the air without promoting a healthy circulation in it. Hot pipes are the most insalubrious, because they absolutely produce no current of air at all, while they burn the organic particles of the air in contact with them, evolving gaseous products which are noxious to the sense of smell, and in some degree injurious to health. Stoves which have no pipe or flue are positively poisonous, they consume the oxygen of the air, and in its stead return carbonic acid into the air of the chamber. No one

could live long in a closed room heated by such a method. The men who deal in them and recommend them must be placed in the same category as the druggist who knowingly dispenses arsenic or strychnia to the suicide; they are even still more culpable, as they dispense the means of death to unconscious victims who are not yet weary of life. Stoves which have a flue form a common method of heating apartments on the Continent; they consume as much oxygen as an open fire, but causing less draught than an open fire, they do less towards making up the deficiency in an element so necessary to life. Our open English fire of sea-coal is thus on all hands the most healthful, as it is certainly the most cheerful method of heating an apartment in the winter.

What is called a "cold" results generally from a repression of the function of the skin. The circulation of the surface is repressed by an undue lowering of the external temperature; the function of perspiration is thus interfered with. The matters ordinarily excreted by this means must pass out of the body somewhere; not obtaining egress by the skin, they are impelled towards the mucous membranes of the respiratory passages, which they irritate to such an extent as to throw them into a state of inflammation, and cause a large quantity of unhealthy mucus to be secreted. A "cold" in the head, with running from the nostrils or eyes; a

"cold" in the lungs, with cough and expectoration, may result from this cause, even in robust persons. The latter accident, in a severe form, is called Bronchitis, because it is the lining of the bronchial tubes which conduct to the air cells, and not of the ultimate air-cells themselves, which is generally affected. More rarely this may be produced in a more direct manner, as by the extra work thrown on the lungs by the increase of cold without, or by the direct contact with the mucous membrane of the cold air that is breathed. But that these two causes seldom operate is shown by the fact that a "cold" is generally prevented by a judicious increase of clothing to the skin. Even in the polar regions such an accident is easily guarded against. There are, certainly, some delicate persons who suffer by the contact of a cold atmosphere with their breathing passages; these may be saved from danger by being kept in a warm atmosphere. In winter they may be removed to such a climate as that of South Devon or Madeira; or they may be kept in apartments the temperature of which is carefully regulated, and which are provided with double glass windows, so as to ward off the contact of the air outside. When out of doors a heated atmosphere for the lungs may be obtained by the use of one of the mouthpieces or "respirators" invented by Mr. Jeffreys; these consist of a number of metal plates or wires, which are heated by the breath which passes out,

and return a portion of that heat to the air which is breathed in. But such precautions for modifying the temperature of the external air should never be resorted to by persons of ordinary vigour, to whom the varieties of outer heat and cold should operate as a healthy stimulus.

The best and natural respirator for men is a moustache, allowed to grow over the mouth. This also prevents the entrance of dust and other hurtful substances into the lungs, and should be worn by all millers, bakers, workers in metals, grinders, &c., who are exposed to serious disease from this cause.

For the poor, whose means of obtaining heat by fire are more limited than with the rich, a sufficiency of bodily clothing becomes more than ever a necessary of life. The crouching and shivering over a few pale embers in the grate, the flinching from the boisterous air which searches out the many weak points of their tattered habiliments, and drives them, in their exhaustion of body, to have recourse to unhealthy stimulants which give temporary relief at a less cost than flannels and blankets, make the winter, which is endurable to the rich, too often a season of suffering to their poorer neighbours. Of all things these flannels and blankets are the best to give away in winter. Money may be otherwise spent, coals improvidently consumed in ill-constructed fireplaces, but the gift of warm clothing will place the recipients of our charity somewhat

more on a par with ourselves, and make us feel even more comfortable than usual when nestled beneath the eiderdown coverlid.

At night more heat must be supplied to the body than in day time; less heat is furnished within, as the respiratory process is not so active during sleep, when a man breathes slowly; and even the circulation is torpid. No man can live healthy who is not sufficiently warm at night; not that he should be too warm, for that would produce perspiration, which is a source of weakness. But he who wakes in the night with a sense of cold, or who does not feel comfortably warm when waking in the morning, may be sure that he ought to have another blanket to his bed. If the bedclothes are insufficient, the head will be buried in the clothes, which is undesirable, because it hinders healthy breathing. The room too will be tightly closed, and the doors and windows never opened; if the bedclothes be not warm enough. Quite as much attention should be paid to the sanitary conditions of the night as to those of the day. At least one third of our lives is spent in sleep, and ventilation, with the other essentials of health, should be as much attended to during this time as during our waking hours; even more care, perhaps, should be spent upon it, as when asleep we are more or less insensible to the wants and sensations which we experience so vividly in the day.

The temperature of a bedroom in which healthy

persons sleep should, as a rule, be lower than that of an apartment in which they live by day. We have ample opportunity of keeping ourselves warm when covered up in bed, where our position is seldom shifted. In climates such as ours, where the night-air is wholesome, we need not be afraid of the open window. There should not be a draught across the head of the bed; but coolness and ventilation may alike be ensured by this means. But I must speak of this again presently.

It would be easy to say much more on the hygienic relations of heat, but enough, perhaps, has been stated for our present purpose, which only concerns the preservation of health. The various amounts of heat are important in questions of climate, and of bathing, hot and cold; but these matters are postponed to the headings Air and Water.

AIR.

There is nothing like going at once to the root of a matter. I therefore commence this section with what may seem to the uninitiated a somewhat paradoxical assertion. Air is the chief food of all organized beings. Vegetables and animals alike are nourished and sustained by it. The vegetable or animal is made up almost entirely of four elementary substances, three of which are gases; viz., oxygen, hydrogen, nitrogen, and carbon. These four elements,

then, constitute their chief food, and they are all found in the air. It is true that animals cannot immediately avail themselves of this food while in the form of air. Could we do this it would save us a vast deal of time and annoyance; we should have no need of those humiliating processes of eating and digestion, which cause us so much trouble. To render the airy elements fit for food, we require, for the most part, the intervention of the vegetable world. Plants appropriate parts of the air, and combine them in such a manner as to form solids out of them, which are fit for the nourishment of animals. A plant may feed entirely on air. Animals feed upon plants, or upon the flesh of other animals, which have first fed upon plants.

These matters, which form the alphabet of physiology, are necessary to be clearly apprehended before we can fully take in the importance of the air around us to ourselves, and to all organized or living beings.

The bulk of the atmosphere consists of the two gases, oxygen and nitrogen, mixed together, but in a simple or uncombined state. Rather less than one-quarter, and more than one-fifth of the air consists of oxygen. The exact proportion is 23 to 77 by weight, and 21 to 79 by measure; oxygen being a little heavier than nitrogen. Carbon and hydrogen are also found in the air in much smaller quantity. These are not found in the simple form, but both

are combined with oxygen. Carbon of itself is a solid, but united with oxygen it forms carbonic acid, a gas (CO_2). Hydrogen united with oxygen forms water, which exists in the air in the condition of a thin vapour. Carbonic acid gas, though half again as heavy as air, is yet perfectly mixed with it by reason of a force which is called the diffusive power of gases. It exists in the air in the proportion of about 1 in 1,000 parts, by weight. Of the vapour of water there is about $1\frac{1}{2}$ in 100 parts or more, according to the degree of dampness in the air.

From the carbonic acid of the air nearly all the carbon of the structure of plants is obtained, and from the watery vapour their hydrogen and oxygen, which are mostly contained in them in the same proportion as in water. When not so, as in fats and albumen, the balance is in favour of hydrogen; so that the free oxygen of the air is not necessary for the ordinary growth of plants. But it is essential to the life of animals. From carbonic acid and watery vapour, plants, which feed chiefly by their leaves, obtain three out of the four elements which are necessary to organic beings. The fourth is nitrogen. This exists largely in the air in a free state; but it is supposed that it cannot when in that condition be made use of by plants. A compound of nitrogen with hydrogen, the alkaline gas ammonia (NH_3), provides them this useful supply. Combined with carbonic acid, this ammonia is found in

air in the proportion of about 1 part in 100,000. It does not exist there in larger quantity, because appropriated and removed by plants as fast as it is formed.

Since, then, it is ultimately upon air that both plants and animals live, it is necessary that it should always be present in sufficient quantity wherever these beings exist, and that its essential nature should not vary. Both of these conditions are complied with by nature. The atmosphere that surrounds our planet extends to a distance of about forty miles from its surface. Its bulk, therefore, is enormous, and its extent far exceeds the height of the loftiest mountains. Its weight, too, is very appreciable. It presses downwards and in all directions with a force of fifteen pounds on every square inch. Like the weight of water on a diver at the bottom of the sea, this pressure is not felt, because it is equal on every part of us. The weight varies somewhat with the changes in the upper regions of the atmosphere. Its variations are measured by the barometer. It was first observed by Torricelli that in a long tube filled with mercury, and closed at one end, if the open end were carefully immersed in a basin of the same metal, the liquid metal in the tube at once sank to a height of thirty inches, leaving a vacuum, or empty space, above it. In fact, the column of air exactly balances (in ordinary states of the atmosphere) thirty inches of mercury, or thirty-three feet

of water. *But the weight of the atmosphere, and the height of the barometer, as I have said, vary,* the latter from twenty-eight to thirty-one inches. This variation, to some extent, corresponds with changes in the weather. For reasons, which I cannot here examine, the column of air is heavier in fine weather, lighter when the weather is foul, or likely to be so. A sudden fall in the barometer betokens the approach of a storm, and puts seamen on their guard.

These ordinary variations are at the ordinary level, which is the level of the surface of the sea, always uniform or nearly so. When we ascend from this surface, the atmosphere becomes lighter in proportion as we leave the dense lower strata behind us; and not only is the downward pressure diminished at great heights, but the air itself is rarefied, expanding and occupying more space, on account of the removal of this pressure. So that at thirty or forty miles the air is probably altogether unfit to sustain life, and expanded to such an extreme tenuity that it could scarcely be weighed at all. Even on ascending a mountain the mercury falls about one inch for each 1,000 feet of ascent from the level plane. So that, putting cold out of the question, no animal could live long on the summit of one of the high Alps, as he would not breathe enough oxygen to keep him alive for any length of time.

But on the surface of the earth the air is at pretty much the same point of concentration always. And,

what is of still more importance, its composition, in essential points, seems to be absolutely uniform. Neither time nor circumstances alter it. Air examined in 1805 by Gay Lussac, and in 1841 by Hoffmann, contained in each case twenty-one per cent. of oxygen. Air, from the top of a mountain, from the depth of a valley, from the breezy plain, from the heart of a city, maintains the exact proportion of oxygen and nitrogen, even of carbonic acid. The impurities of air, where they occur, are minute and difficult of discovery, and do not concern the amounts of these vital constituents. This is kept equal by constant currents in the atmosphere, and by the mutual action and reaction of the life of animals and plants.

For animals and plants both breathe air, but have an opposite use to make of it. The animal absorbs oxygen, and gives off carbonic acid. The plant absorbs carbonic acid, and gives off oxygen.

The air which a man breathes into his lungs makes its exit again in a different state. The lungs terminate in a number of cells, with a very delicate lining membrane. On the other side of these cells is a fine network of minute bloodvessels, called capillaries. These form the connecting link between the terminal branches of the pulmonary veins and the commencing branches of the pulmonary arteries. They have coats of such extreme tenuity that a gas finds little difficulty in passing through them and

the lining membrane of the air-cell with which they are in contact. Oxygen passes through them inwards, and carbonic acid gas passes through them in an outward direction. This causes at once a change in the blood and a change in the air. The former is transmuted from venous blood, of a dull red hue, into arterial blood, of a bright red colour. Arterial blood contains five per cent. more of oxygen, and five per cent. less of carbonic acid, than venous blood. This highly oxygenated blood passes by the pulmonary veins to the heart, and thence is distributed through the whole system by the branches of the great artery, the aorta. In this its course, and especially in the ultimate capillaries into which the arteries divide, the oxygen of the arterial blood is brought in contact with carbonaceous matters, derived from the food and from the decomposition of the tissues. Uniting with this, it at length produces carbonic acid. So that the veins, which are derived from the gradual union of these terminal capillaries, contain blood which holds in solution more carbonic acid and less oxygen. By this union of oxygen with carbon, a sort of smothered combustion, heat is produced, which is necessary to the life of an animal. The carbonated, or venous blood, passes back again by the veins to the heart, and thence to the lungs. Here it is exposed to the respired air; it parts with carbonic acid, and takes in oxygen instead, becoming arterial as before. The continual circula-

tion of the blood, so necessary to this process, was first clearly pointed out by Harvey. It is maintained by the rhythmical contractions or beatings of the heart, which, by the aid of a system of valves, specially arranged for the purpose, propel the blood always in the same direction.

The air expired contains thus more carbonic acid, and less oxygen, than the air breathed in. A full-grown man exhales 29 ounces of carbonic acid, equivalent to about 8 ounces of carbon, in every twenty-four hours, and consumes in the same time 32 ounces of oxygen. A part of the oxygen unites with hydrogen in the system, to form water, of which 16 ounces are exhaled by the lungs, in the form of vapour, by an adult every day. A great loss of weight would be incurred by this process were it not for the continual supply of solid food.

We perceive from these simple facts the paramount importance of an abundance of air in a pure state. Animals, and the other causes of combustion which are at work on the surface of the globe, tend constantly to deteriorate the quality of the air, to load it with carbonic acid, and deprive it of oxygen. Plants, meanwhile, have an opposite action on it. Their breathing mouths, the innumerable *stomates* of their leaves, take in the air which surrounds them. Their juices absorb the carbonic acid; the carbon is fixed in their tissues; and the oxygen which remains is set free and exhaled. Thus they

enrich the air for animals, and animals enrich it for them.

Poggendorf, after reckoning the whole amount of oxygen in the atmosphere of our globe, has calculated that it would take all the animals living, and all the processes of burning fuel, and so forth, that are continually in action, 5,000 years to consume one-200th part of it. It would be replaced by carbonic acid gas. This change is prevented by plants. Yet, if there were no plants living, and supposing we could subsist without food, the air would last us a few thousand years more, in so far as the supply of oxygen is concerned. Its replacement by carbonic acid would gradually render it poisonous. It is in a confined space, where a small quantity is acted on at a time, that we perceive the evil effects of our respiration on this fluid. We have seen that, in the daily life of each of us, a large quantity of oxygen is required, and, therefore, five times as much air. The nitrogen in air serves only to dilute the oxygen, and prevent it from being too stimulating. It is neutral, and has no action of its own that we can discover. Even before exhausted of oxygen, the air becomes unrespirable by reason of the carbonic acid produced. One per cent. of this gas produces headache, two per cent. narcotism, five per cent. is poisonous, causing death if breathed for any length of time; ten per cent. would probably cause death immediately. So we are led to suppose

by the fatal accidents that have so frequently happened with this gas. It is produced by fermentation, and thus collects at the bottom of brewers' vats. It emanates from the earth in some places, as in the Grotto del Cane, at Naples, and the Valley of Death, in Java. It issues from the seams of coal strata, forming the fatal choke-damp of the mine. But the commonest sources of carbonic acid gas are, as I have said, combustion and animal life, which are one and the same process in fact.

The burning of charcoal in a closed bedchamber, which may kill the inmates by producing gradual asphyxia, is a favourite method of suicide in France. Of the miserable victims of the Nabob of Bengal, 146 were confined in a small prison in the evening, and in the morning but 23 remained alive. Every little parlour in which a stove or fire is burning, while the ingress of air is prevented by tight-fitting and listed doors, and sandbagged windows, is a humble imitation of the Frenchman's chamber of death. Every crowded, unventilated church or assembly-room is a miniature "black hole." One envies the delicate women who are carried out fainting from such places; they at least escape the consequences of remaining longer. I have seen a large church in London, a mass of galleries and pews piled upon one another, like Ossa on Pelion, which held, when crammed to repletion, some 3,000 persons. I have seen such a church so full that

there was no standing-room, on a day by no means cold, with every door and window closed as tightly as it could be. Well might the miserable sufferers pray to be delivered from "murder and sudden death." If educated persons exhibit no better judgment than this, the arrangement of such matters should be transferred to the hands of the police.

In public institutions, such as workhouses and hospitals, attention is now-a-days paid to the due supply of air to the inmates. This depends on two things. First is the capacity of the chamber, second is the introduction of fresh air by ventilation. The room where persons dwell must be of a certain size, because it may sometimes be closed, and when open there is a limit to the introduction of fresh air in sufficient amount. Sleeping-rooms, where a number of persons are unhealthily crowded together, have been for a long time so common in poor parts of towns as to constitute a standing reproach to our social system. Even now the provisions of the "Lodging-house Act" are often easily evaded. It may be laid down as a rule in the construction of dormitories, that whatever the number of persons in them, 1,000 cubic feet of air *at least* should be allowed for each of them. That is to say, there should be for every person a clear space of ten feet each way. Much more than this is generally given in hospitals, where the wards are high. There should be one window, if possible, between each pair

of beds in such a room, and it should seldom or never be entirely closed. Rooms of certain size are conducive to health, but, if too large, it becomes difficult to warm them, and the temptation to keep them closed may become irresistible.

All that has been said hitherto on the subject of air must tend to one conclusion. It should serve to impress upon every one more strongly than ever the paramount importance of *ventilation*—of a constant supply of fresh air in every apartment intended for the habitation of human beings. There cannot be a greater absurdity, one might almost say wickedness, than to keep such rooms shut up and confined. There are needed for this ventilation at least two openings in every apartment; one by which the air may enter, another by which it may obtain egress. These must be of sufficient size, or the object will not be attained. Unless there is a current of some kind, the interchange of fresh air with that which has been breathed and become impure will not be provided for. The various little contrivances called ventilators are more or less superfluous in an apartment of ordinary construction. There is an invention of Dr. Arnott's, a little valve fixed in the wall opposite the chimney, delicately weighted, so as to allow the passage of air up the chimney whenever the atmosphere inside is warmer than that without, so that it is enabled to push the valve upwards. As the heated air from the lungs or from gaslights

passes mostly to the upper part of the room, this Arnott's ventilator may serve a certain purpose, but by itself it is insufficient. The open fireplace, with the open door or window, is the swiftest means for the outlet and inlet of air. The "draught," so much complained of by delicate persons, is caused by the inlet being of insufficient size, so that the air has to traverse the room in a small and swift current. The means which are so frequently employed for stuffing up doors and windows tend absolutely to produce a draught, for this reason. The door should be so constructed as to admit air to some extent both above and below. A ready exit by the chimney should always be allowed. Where there is a fire burning, as in winter, air must of course enter to maintain that combustion, and to carry the smoke up the chimney. But in summer, too, the fireplace should be left open. Those who close the chimney with a sack do their best to render their rooms unfit for human habitation. If a man were to deprive himself of air by gagging his mouth and plugging his nostrils, he would be justly condemned as a suicide. Is he not also worthy of blame who cuts off from himself and his family the full supply of air which is necessary for health, and encourages a kind of slow suffocation which fosters every sort of disease?

Of all means of entrance for air the open window is the best. The door admits the air from the house, already partially tainted by human life and its re-

sults. The window admits the free air from outside, which should be pure, and is certain to be the purest within our reach. Admitting this fact, some persons supply the place of the open window by a perforated pane of glass near the top, or a ventilator that is sometimes closed, sometimes open. To keep the whole window open is the best—not only when the room is emptied of its usual occupants—to air the room, as the phrase is—but *always*. To confess that the room needs airing is to admit that its late inmates have been labouring under circumstances prejudicial to health. Why need this have been? I wish strongly to insist upon the fact that of all household arrangements, the most elemental in its importance, the most conducive to health, is the constantly open window. If the air be cold, the heat of the apartment may be supplied by a fire. It is chiefly, after all, a matter of habit. Those who have not been used to it may suffer slightly at first; but when once they have given the plan a fair trial, they will never revert to their closed apartments again. It is, as I have said before, a misfortune of our artificial state of life that we are obliged to spend a great part of our time in houses, instead of living constantly in the open air. We should therefore do everything that lies in our power to assimilate this unnatural existence of ours to that for which our physical structure has best fitted us.

At night, too, as well as in the day, the window

should be left open. The retention of the body in one place renders it more than ever desirable that the air around it should be pure. Sleep renders us unconscious of that discomfort which a confined atmosphere would cause us to experience in the day-time. If the air is cold, we can increase the weight of the bedclothes, which is better than having a fire in the apartment. A draught across the head of the bed may easily be prevented by arranging a curtain or altering the position of the bed. In most bedrooms it will be found both easy and comfortable to keep the window open at night both in summer and winter. The only exceptions to the rule, and those are few, are the instances of malarious and aguish districts. An unhealthy effluvium is apt in such spots to be evolved from the soil between the setting and rising of the sun. Such localities are fortunately uncommon in England. The marshy districts of Southern Italy, the half-stagnant canals of Venice or Amsterdam, the embouchures of great rivers, as of the Rhone into the Lake of Geneva, are cases in point. In such neighbourhoods we are fain to submit to one evil to escape a greater, and we have an excuse for closing our apartment by night.

The greatest blot in the sanitary education of the poor is their predilection for close rooms. The window so constantly shut that it will not open, admitting no air and little light—the door closed as firmly as its frail construction will admit—the grate stuffed

up if possible—the air of the room, in which several human beings pass the greater part of the day and all the night, stifling or even fetid, as the natural consequence of such misuse—these form a concatenation of circumstances which the poor in our large towns are too apt to describe as "comfortable." To this, as much, perhaps, as to insufficient clothing and food, is it owing that their looks are so squalid, their frames so ill-nourished. And yet for their neglect of ventilation, they have an excuse which the rich have not. They are so thinly clad that they fear the cold. The want of firing in winter adds to the misery which results from the want of clothing. In supplying them with blankets and flannels, we are at once relieving them from this cause of suffering, and enabling them to taste the blessing, which their poverty denied them before, the blessing of fresh air. It is a duty which should always be present to the mind of the clergy and others who visit the poor in their homes—that of continually instructing them on this most vital point. At the same time that they advise them to air their apartments, they can explain to them the reason why a continual change of air is so necessary to human life. They can tell them that air is as necessary—even more necessary—to them than the food they eat. It will be found that the poor are at least as open to reason as their superiors in refinement and social status. They have their prejudices, but are not able to intrench them-

selves behind that false assumption of sufficient knowledge which often renders those others so vain and confident in their errors.

Besides the carbonic acid given off from the lungs, another fruitful cause of the contamination of air arises from the decomposition of animal and vegetable matters. Dead animals and plants, and the organic matters excreted by animals, decompose or rot when exposed to the air, and, in so doing, resolve themselves gradually into a number of gases which are hurtful to animal life. Fortunately for us, one of the chiefest and most noxious of these gases—sulphuretted hydrogen—has a disagreeable odour, which enables us instinctively to avoid it, and affords us a strong motive for ridding ourselves of all the well-known causes which give rise to it. Its odour is the well-known odour of animal decay. This gas is very poisonous, even more so than carbonic acid. And yet, in company with it, there are other effluvia, less easily recognised by the senses, and more complex in their chemical nature, which are far more dangerous to life than sulphuretted hydrogen. To these must be attributed the frequent sickness and mortality that result from foul drains, putrid dung-heaps, opened cesspools, crowded churchyards. Such foes of health as these are should be carefully avoided and kept at bay. A chemical disinfectant, such as chloride of lime, may purify the air for a time, but will not remove the cause, which will again contami-

nate the atmosphere. It is even uncertain whether those insidious gases to which I have alluded are sufficiently decomposed by any disinfecting agent. The only means of keeping the air of houses and streets pure from such foulnesses consists in a perfect system of drainage, in the copious use of water to carry away into the sewer all the refuse of our houses, and the constant removal of the solid contents of the dustbin. Household cleanliness is as important to health and comfort as cleanliness of the person.

CLIMATE.—Whole books have been written on the subject of climate. I have merely to touch upon the subject as necessary to be regarded if we would consider the preservation of health in its widest bearings. The term "climate" is used to signify the condition of atmosphere which prevails at any locality. It is sometimes employed loosely with reference to heat only—a climate or a place being spoken of as warm, temperate, or cold. But in speaking strictly of a climate, we include all the atmospheric conditions, such as moisture or dryness, the prevailing wind, the elevation or aspect of a place, the character of the soil, and all causes which affect the air.

Certain peculiarities of climate are applicable to special diseases: as a warm, agreeable, and moderately moist climate for advanced consumption; a

dry and even climate for rheumatism. But we are speaking now of climate as adapted to healthy persons.

A temperate climate, as every one knows, is more conducive to health than a hot or a cold one. The climate of England is temperate, but not equable. Thus, in London, the average temperature is 50°, including winter and summer; but, during seventeen years, as observed at Chiswick, it has varied from a heat of 130° to a cold of —4° of Fahrenheit's thermometer. The ordinary heat of summer is 70°, of winter, 40°. But the English climate is subject to great and sudden variations. As travellers over the Great St. Bernard may swelter in a tropical sun in the morning and shiver in the evening with the thermometer at zero, so even in this country it may happen that the index rises or falls as much as fifty degrees in a day. To delicate constitutions, such changes are prejudicial; but they are bracing and exhilarating to persons of a healthy frame. It is chiefly owing to this much-abused climate of ours that the English are the healthiest, best-grown, and longest-lived people in the world—facts which are proved by statistics. Of localities in this island, those at the seaside are the most equable in temperature, because the sea, on which their temperature depends in part, is far more constant in its heat than the land. The air at seaside places is rendered purer by the proximity to so large

a body of water, which removes noxious gases; it is rendered moister by this great evaporating surface and the winds that blow over it; and it differs from the air inland by containing more *ozone*, a peculiar condition of oxygen, more stimulating to animal life than that gas in its ordinary state. Particles of salt, in a finely divided state, are contained in the wind from the sea.

The moisture or dryness of a climate is a matter of great importance. There is always some watery vapour present in the air, but in some places it is more abundant than in others. It is measured by an instrument called a "hygrometer." This is variously made, but its object is simply to ascertain the "dew-point"—*i.e.*, the degree of cold necessary to fix the atmospheric moisture, causing it to be condensed as water. The less the amount of moisture, the greater the degree of cold required to condense it. In London and the neighbourhood the mean dew-point stands at 47°.

Sir James Clark, in his valuable work on climate, observes that, "of all the physical qualities of the air, humidity is the most injurious to human life." But this dictum of his must be accepted with considerable modification, or, rather, be understood as only applying to excessive humidity. Otherwise we must be prepared to assert that England is more unhealthy than the Continent, Ireland than England, and that a life in the country is less conducive to

health than life in a town; none of which assertions will hold good.

Evaporation is constantly going on from the soil in rural districts. The showers of rain that fall are quickly returned to the atmosphere by the help of the sun and wind. In towns the whole surface of the ground is covered with an impervious paving, and the rain and water, instead of soaking into the earth, are carried off by the sewers. Vegetation, which keeps up the moisture of the air, is comparatively absent, and continual fires in all the houses help to dry up and heat the air. Hence the air in the country is considerably moister than the air in towns. The air at seaside places is moister than the air inland, on account of the proximity of a vast body of water. The winds of the ocean carry watery vapours with them. The south and the west winds, which pass over the most extensive surfaces of water, are the most humid winds in England. The east wind is dry, because coming from the Continent; and the western and southern coasts of the British isles have a moister atmosphere than any other part, because most exposed to the winds that come over the ocean.

The fact that an island enjoys a moister atmosphere than a continent has an important bearing on the development of the men who inhabit these different localities. A moderate degree of moisture in the air is conducive to bodily strength and beauty,

and favours longevity. France, and most parts of Germany, have a drier atmosphere than England. In those countries life seems to burn out quicker; men and women grow old faster than they do in this island. The same cause that influences the vigour of muscle, and the power of endurance of a man, may be supposed to endow him with superior qualities of mind. The subject, which is an invidious one, need not be further pursued; but I conceive that these atmospheric conditions are not the least among the causes which make of an island such as ours the appropriate centre of empire. Here, at all events, the Anglo-Saxon race seems to find its most fitting habitation. Much has been vainly said about its power of universal adaptation, but it is matter of grave doubt whether history will confirm such a theory. The nations that are springing up in America and Australia are, in many respects, unlike their fathers. The change of type, which is universally acknowledged, is certainly in the direction of degeneracy, and impresses upon us the strange conviction that the English character and countenance can only for a season be transplanted from the English soil.

Excessive moisture is prejudicial to health. By engendering a marshy and putrescent state of soil, it gives rise to agues and other fevers.

Heat and moisture are the two most important elements of climate. But they are not all. I have

already alluded to the wind, as connected with moisture and dryness. The salubrity of a place depends much on its prevailing winds. Not that these are of so much importance to an adult person in robust health, but they affect delicate persons and young children to a marked extent. The winds from the north and east, coming from the direction of the Pole, are cold; the south and west, from the equator and warm regions, are warm. The latter also, blowing over the vast evaporating surfaces of the Pacific and Atlantic oceans, are ordinarily charged with moisture, while the east wind, coming to us over three terrestrial continents, is the driest of all the winds. For this reason the east wind is unhealthy. The north-east, which combines dryness with cold, has a pinching and withering influence on susceptible persons. Localities which are free from such winds as these are commonly accounted salubrious. Much depends on the hills or mountains near a city or town. The cliffs that stand behind a watering-place on the south coast of England leave it exposed only to the south wind. The unprotected plains of the Eastern and Midland Counties are open to every wind that blows. Such exposure may be even beneficial to a strong man, or one whose constitution is benefited by continual change of climate, and would suffer in the unchanging monotony of a southern sanatorium; and, whatever advantage may attend a partial protection by hills, it is certain that

no situation can be more unhealthy than that of a place entirely surrounded by them. In such a place there is a stagnation of air, and probably of water as well. The air has no mode of ready ingress or egress in such a valley, and the water that runs into it subsides to its lowest level. The atmosphere becomes oppressive, the water gives off noxious vapours; all kinds of disease are fostered by such a condition of things. Among the Alps of Switzerland and Savoy such valleys are frequent, and it is there that scrofula, goitre, and idiotcy (cretinism) prevail to such a melancholy extent. Goitre also is found in similar localities in England, being called, from its frequency in one county, the "Derbyshire neck."

Thus a confined situation is a cause of insalubrity. A still more potent cause is a marshy condition of ground. To marsh malaria are due the agues of England, the remittent fevers of Italy, the terrible epidemics of the western coast of Africa. The poison which causes these disorders is atmospheric, and lies near the ground. It is said to be more active at night, when it is thought to be precipitated like dew. It arises from the slow decomposition of a vegetating surface of soil impregnated with moisture. There is no cure for it but to drain the soil, and bring it under cultivation. Even this sometimes aggravates the evil at first; for the marsh poison is soluble in water, and the first effect of

drying up the water is to let loose the malaria which it held dissolved. Thus the draining of the Haarlem Lake, and consequent exposure and desiccation of a large surface of ground, has been followed by an increase of ague throughout Holland, and has added, it is thought, to the mortality of the present year. But the ultimate result of such a proceeding must be to remove a cause of disease. It is curious, moreover, that many dangerous centres of malaria seem hardly to be marshy at all. A large part of the so-called Pontine marshes, and of the pestiferous Roman Campagna, is as dry as an upland moor in England. There is probably here a great depth of turfy soil, the debris of the reeds, grasses, and mosses of ages past, undergoing slowly that decomposition which, when fostered by warmth, produces the malarious poison, but in temperate climates leads slowly and harmlessly to the formation of peat.

Just as low situations are unhealthy, high situations are salubrious, within certain limits. There can be no stagnating water; the malaria of the plain is far below; there is continual change of air; no hills or trees deny the full benefit of the sun's rays; and the pressure of the atmosphere is less than it is below. This imparts a buoyancy to the mind, and stimulates the functions of the body. This is so, at least, so long as the height is not too great. Above a certain height the air is too cold, and the atmosphere too rarefied to support life satisfactorily for a

length of time. In this country it is difficult to make the experiment of living too high. The chief evil that would happen to a man who pitched his tent on the top of Snowdon or Helvellyn would consist in his isolation from the rest of his species. But in Switzerland the mountains attain a height of 15,000 instead of 5,000 feet. It is found decidedly unhealthy to live above the limit of perpetual snow. The convent on the Great St. Bernard is in that predicament, and I have been assured that the average life of the monks after entering on their duties there is only seven years. They are young at first, but soon look old. They endeavour to prolong their lives by occasional removal to a so-called sanatorium at Martigny, in the Lower Valais, itself a pestilential hole, teeming with disease and unfit for human life.

The climate of towns must be admitted to be more unhealthy than that of country places. While the mortality of healthy country places in England stands at 17 in 1,000 per annum, that of London cannot, by all our sanitary improvements, be reduced below 20, and stands often nearer to 21 or 22. Paris is more unhealthy than London; the mortality at Vienna is considerably greater than at Paris. But let us look at home. Every year there die in London, in excess of what we must consider as the natural or inevitable rate of mortality, a larger number of persons than would fall in a great battle. I do not complain of those myriads who share the

common lot, but of those ten or twelve thousand victims who every year (in London alone) are sacrificed to the modern mania of living in great towns. It behoves men who have the welfare of their species at heart, or who, from economical motives, consider human life a thing worth preserving, to ponder very seriously over the causes of this great loss, with a view to their gradual removal or mitigation as far as is possible. Much of the evil arises from an impurity of the atmosphere. The climate of a town differs in this from the air in the country, that the air which we breathe is less pure. True that the impurity may be so infinitesimal as to be undiscoverable by ordinary chemical tests; it is enough to affect us when we are constantly breathing it. That it must be contaminated is sufficiently proved by the many sources of contamination which are constantly at work in a town.

Among these I do not reckon smoke or soot, though vulgarly much importance is attached to it. The smoky atmosphere of the city is beneficial in some asthmatic cases. And in many continental towns, where scarcely any coal is burned, the mortality is far higher than in London. Coal-fires contaminate the air no more than other kinds of fuel, *i.e.*, by producing carbonic acid and using up oxygen.

The crowded streets, the narrow courts, the close dwellings and places of business, make the air unfit

for health by surcharging it with the products of human respiration. Much of the sickness of towns has been ascribed to bad water. I think too much has been made of this. The great fault is an insufficient supply of water, which allows putrifying organic substances to contaminate the air when they should be washed away. A sufficient system of drainage, carried out in all its details, domestic as well as public, and plenty of water to work it, are the great necessaries of healthy life in towns. This drainage, with an improved method of building streets and houses, and regard to the ventilation of houses, will tend, if properly carried out, to make London almost as healthy as a breezy village in Kent or a down in Surrey.

I have spoken of drains as removing foul products and keeping the air pure. But it must be borne in mind that bad air is not always sensible to the smell. Wherever man or animals live, and there is no current sufficient to cause proper change, there must be bad air. Some such sentence as this should be written in letters of gold over every house-door.

A word or two now on the use of climate, and on the benefits of *change of air.* Persons living in towns should get as much of the open air as they can, go out as much as possible. Those whose occupations are strictly sedentary should devote a portion, however small, of every day to out-of-door exercise. Walking is the best, and riding on horseback the

next best of all forms of exercise. Those who abstain from this, and find that they suffer in health, should not lay their own fault upon the climate of the town, which is really but little to blame. London, on the whole, is healthy. A movement which has lately taken place among the young men of towns, having its origin in a patriotic and manly instinct, I mean the formation of corps of Volunteer Rifles, has served the double purpose of conducing to the health and strength of those who have enlisted in it, and of affording us an efficient means of defence in case of any sudden surprise on the part of a possible enemy. The energy and spirit with which the young men, who have taken upon their shoulders the duties of those regular defenders in which we are deficient, have engaged in drilling and shooting, in marching and manœuvring, has supplied them with a motive for exertion during their leisure hours, and has already made its results apparent in the improved bearing and more healthy appearance of great numbers amongst them. Let us hope that this spirit of volunteering may not speedily die out, or be traceable to any transient enthusiasm. It has already supplied a new and most praiseworthy form of athletic exercise to those who were becoming weary of the various sports, unfortunately half extinct among us, with which past generations were wont to recruit their health and spirits.

Though London, as I have said, is healthy for a

town, by reason of its open situation and means of sufficient drainage, an occasional change of climate and scene is certainly beneficial to Londoners. And this chiefly, because with such a change comes freedom from work, and all that reminds of work. Man is not suited by his nature for continual toil, least of all, mental toil; on this account it has come to be considered necessary for every one in this town who can by any possibility afford it, to take a yearly holiday. In the summer he flies to the green fields, or, in the autumn, he takes himself to the sea. A short holiday for the poorer, a long holiday for the richer classes, but the motive for each is the same. Of a long holiday we need not speak so much, as that can be taken only by those who have much leisure, and can choose at any time their place of residence. The short holiday, say a week to a month, is looked forward to by those to whom it has almost become a necessary of life. Fortunately, this holiday once a year has come to be quite an institution among the middle classes in London. It is important, then, to know how to spend it in a manner most conducive to health. The best manner, I think, of spending a short holiday, is to choose the best possible air, or most agreeable scene, and there to resign oneself to a perfect *abandon* of idleness. Let all thoughts of business whatever be dismissed, all mental toil suspended. The object is to return after a while to one's customary avocations

with a body better braced, a mind fresher and freer than before. For the student this is even more necessary than for the man of business. Reading parties during the vacation are, as far as their ostensible business goes, a delusion and a snare. The less reading done under such circumstances the better. Charles Lamb's description of his occasional holiday at the Bluecoat school, Mr. Frith's picture of the Ramsgate sands, both seem admirably adapted to realize such a holiday as that which I mean. The business of a holiday is "relaxation," to put it euphoniously; *idleness*, to express it more truly. Above all, let a man be as much in the open air as possible, and get all the sun he can. If fine, let him stroll about, and lie on the grass when tired. At the seaside, let him be constantly on the sea or in it, row himself in a boat, sail, bathe, or swim. Never forget that easily obeyed maxim—to avoid all work. Another kind of work, not less onerous than what one is used to at home, is imposed upon a man in some places. The great fault of the so-called fashionable watering-places is that you are apt to see too many people that you know, so become wearied by the necessary attention to dress and the recurring labour of uninteresting conversation. This, and the other attendant annoyances (*verbum sat sapienti*), forms the curse of such places as Brighton, St. Leonard's, Tonbridge, Cheltenham, and Leamington,

which are generally most agreeable when it is not "the season."

For people who, even in a holiday, must have occupation, and there probably are such, no better pursuit can be recommended than the study of Botany or Natural History, as these are sciences which must be cultivated in the open air, and are novelties to the dwellers in towns. Fishing or shooting are also among our most admirable English inventions for combining pleasure with some sort of occupation.

Those who can extend their holiday to a continental tour will find their relaxation more complete in proportion to the completeness of the contrast to all to which they are accustomed. Yet the benefit derived to body and mind is not always proportioned to the trouble and expense incurred. Many men return from a tour rather the worse in health, and but little the wiser for what they have seen. We have mentioned *work* as one great mistake in those who are taking a holiday and wish to profit by it. Now intellectual labour is rarely resorted to in travelling. Dr. James Johnson has remarked that the excitement of travel perfectly unfits the mind for its ordinary occupation. But a mistake of another kind is often committed by tourists; they over-exert their bodies. Moderate walking exercise is very good for the young at all

times. Let those who will walk on foot through the towns of the Rhine, or stride with beechen staff over Swiss alps or Tyrolese mountains. This is just as legitimate a method of enjoying oneself as driving with an Italian vetturino, or alone in a Norwegian carriole, gliding in a Venetian gondola, yachting in the Mediterranean, or boating up the cataracts of the Nile; the only thing is not to overdo it, or overtask the strength by way of needless bravado. There cannot be a more honest ambition than that of the members of the Alpine Club, whose indefatigable energy carries them to the summits of the snowy peaks which for ages have defied the climber. But such labours are for the young and athletic, whose hardy frames are still further braced by this discipline, and cannot by any means be recommended as a general example. Just as little is it advisable for those who require rest to set themselves the task of acquiring in a few days such a knowledge of some continental city as they have never sought to have of any town in their native England. Beyond a certain point, churches and picture-galleries, palaces and town-halls, are a weariness to the flesh and to the spirit. It is an idle boast, that of having "seen everything." It would be better to have learned something, and it is far easier. Nothing so simple as to put your guide book in your pocket sometimes, to saunter through the streets and into the byeways of a foreign city,

endeavouring to acquaint yourself with the general aspect, the language, the manners and feelings of a people. It would be easy to write a book on the philosophy of travel, a science of which most tourists are wofully ignorant. Every Englishman is such a creature of habit, that he will follow in the beaten path that others have trod before him. But to return from this digression. Though the object of a continental tourist is not to obtain that absolute and simple rest which is the aim of a short holiday, it should be always borne in mind that a too rapid succession of places and objects is not only excessively fatiguing, but confusing to the mind, so that if he attempt to do or to see too much, he will be likely to return home unrefreshed in body, and without having gained any vivid or useful impressions from the multitude of things that he has seen.

WATER.

The all but universal liquid, which covers three-fourths of the entire surface of the globe, enters into the composition of the atmosphere, of all organic and of many inorganic substances, is second only to air in its importance to the life of man.

Water is composed of the two gases oxygen and hydrogen, united in the proportion of eight parts by weight of oxygen to one of hydrogen. A galvanic current decomposes it, causing one gas to be evolved at one pole, the other at the other pole. One

volume of hydrogen is produced for each half volume of oxygen, the latter gas being just sixteen times as heavy as hydrogen. The two gases are united in the proportions of their chemical equivalents. The chemical symbol of water is HO. It is important to bear in mind the composition of water, as it bears on certain questions connected with diet and nutrition.

Water solidifies or freezes at a temperature of 32° Fahr., forming ice, which is lighter than itself; at 212° it boils, and passes into steam, an elastic vapour which exceeds, by 1,700 times, the bulk of the water which produced it. Water also evaporates gradually at all temperatures above the freezing point, passing into the air in the form of an insensible vapour. This vapour is precipitated by cold, and the more vapour there is in the air the less the reduction of temperature which is needed to separate it. To the presence of this vapour in the air at different times and places in different amount, and its gradual or sudden precipitation, by an access of cold (more or less excessive), the multiplied phenomena of dew, rain, snow, and hail, are owing.

Forming, as it does, more than half the weight of animal and vegetable bodies, the importance of water to life may be well admitted. But it is not merely useful in entering into our substance, giving softness and suppleness to the frame; it has a still wider function to fulfil. Water is the universal solvent of nature. Not that it will dissolve all substances—but

a very large number. Thus, it dissolves all gases, all acids and alkalies, nearly all mineral and metallic salts, nearly all animal and vegetable compounds. The last, indeed, may have to undergo some change before being dissolved.

It is this function of dissolving which enables water to play so important a part in animal life. It is employed to dissolve the materials of the food, that they may gain entrance from the stomach into the blood. In the blood it holds the nutrient matters in solution, and carries them to every part of the body to renovate the tissues. Finding in these tissues certain effete and decaying atoms which have done their work and are wanted no more, the same watery fluid washes them away with it; and, when the blood reaches the glands, these atoms are carried away through them out of the body, the water still in their company. Thus, in digestion, nutrition, circulation, secretion, water plays an essential part.

The several kinds of water in common use vary according to the quantity of saline matter which they hold in solution.

Distilled water is nearly pure from foreign admixture; as in distillation the solids which the water may have held in solution are left behind, and the gases dissipated. Distilled water is very insipid to the taste. It is used in chemical processes, and in preparing medicinal solutions. Though in compounding a prescription, it is always better to use

distilled water, in the majority of instances common water may be substituted without any serious harm.

Rain-water, produced by nature's own still, stands next to distilled water in order of purity. Such solid matters as the rain encounters in its descent, it carries with it. It holds in solution pure carbonic acid gas and ammonia, both obtained from the air. Rain-water is called *soft* because it combines well with soap, and is thus used for washing. The property of *hardness* in other waters is due to the mineral matters which they contain.

River-water comes next to rain-water in its freedom from mineral impurity. It consists, in fact, of rain-water and spring water mixed. When near the sea the water becomes brackish and unfit for use. River water contains ordinarily about twenty grains of saline or solid matter in the gallon (that is, 1 grain in 3,500). Besides this it holds in solution, like all waters (except distilled water) some carbonic acid and common air. About sixteen parts of the twenty of solids consist of carbonate of lime, the rest being chiefly common salt and sulphate of lime. Now, as the carbonate of lime is insoluble in water, it is only held in solution by the carbonic acid present (which has the property of dissolving chalk, or carbonate of lime). In proportion to the quantity of the earthy salts it contains does water become unfit for washing and cooking purposes. But river water is well adapted for washing, not containing enough of these

salts to precipitate* soap to any extent. It is also used extensively for drinking, and is well fitted for this purpose, except where the neighbourhood of a large town has caused it to become contaminated with sewerage. It may then contain organic matters of various kinds, sulphuretted hydrogen, and so forth. The filthy habit of supplying a town with water drawn from the neighbourhood of the outlet of a great sewer into the river has been at last obliged to be given up by the good sense and humanity of the age. Half London is now supplied by the New River, which flows in an artificial canal constructed as a continuation of the Colne. The other half is furnished by Companies which draw their water from the Thames, at various points, at a tolerably safe distance from town. This is the water that is used for all household purposes, that forms the vehicle of our soups, broths, tea, coffee, and the rest. It is used, too, for washing, and may often be drunk alone in preference to the water obtained from wells in London.

Spring-water collects in crevices and chasms in the earth below the surface. It is got at by sinking a well, and raised by a pump. As the water, in percolating the soil, dissolves all the soluble mineral matters within its reach, spring-water is the hardest of the waters in common use. It contains usually from twenty-five to thirty grains of calcareous and

* To separate, or throw down in the undissolved state.

other salts in each gallon, as well as carbonic acid gas. In ordinary cases its ingredients, though greater in amount, are the same as in river-water. If there is any quantity of saline or mineral matter present, owing to a peculiarity in the soil, the water becomes a mineral water, and is unfit for ordinary use. The earthy salts in spring-water precipitate soap. It is thus called "hard," and is unfitted for washing. Its solvent power is inferior to that of soft water, and it is thus not so good for making tea, or for cooking. However, boiling it for some time does much to soften it, as the heat drives off the carbonic acid gas, so that the carbonate of lime is precipitated. In this way crusts are formed at the bottom of kettles and caldrons. Spring-water is more agreeable to the taste than river-water. When fresh it sparkles with the carbonic acid it contains. Being free from obvious impurity or dirt, it is commonly considered *pure,* and is universally preferred for drinking purposes. However, it is not always the most wholesome. Hard water makes the coat of a thoroughbred horse "stare." It is prejudicial in dyspeptic or calculous affections. The water drawn from the wells in London is liable to causes of contamination which would make many hesitate to drink it, did they consider them. Most of these springs are near the surface, and the water which infiltrates the mud of the street percolates to them through the soil, carrying its animal as well as mineral impurities.

Some springs in the City are liable to organic admixture of a yet more loathsome kind. They are close to churchyards. The water has been found to contain *nitrates*, and other results of the decomposition of animal remains. It is clear and sparkling in appearance, and its taste to many persons is pleasant. It is unwholesome as well as disgusting; but it has been found difficult to persuade all its drinkers of the fact. Those who believe in the salubrity of Smithfield market, and extol the fragrant breezes that hover over the Thames in August, must so far differ from the rest of their fellow-men, that it is possible they have no objection to garnishing their table with a cold infusion of their ancestors. Sewers have been known to gain entrance into springs in London; and the late Dr. Snow attributed an epidemic of cholera to such a cause of contamination. This is enough to make us cautious about spring-water.

It is sometimes necessary to be acquainted with some test that will determine roughly the degree of hardness in a specimen of water. The simplest for this purpose are the soap test, or the oxalate of ammonia test. Any one may use them, taking ordinary care, having all the vessels clean, and all the solutions used perfectly clear. It will be well to have three test tubes, phials, or glasses, of exactly equal size. Put into them (ranged side by side) some distilled water, some ordinary river water,

and the water to be tested, pouring the same quantity into each glass. Test all three, and then, by comparing them, the degree of hardness of the third specimen may be approximatively arrived at. The first test consists in dropping into the glass of water one drop of a solution of soap in ether. This is a general test of hardness. There should be no change, or very little, in the distilled water; there will be a cloud in the second specimen from the river; and in the third, a white opacity, thick or not according to the degree of hardness. The other test is a test for lime. Fresh samples of the waters must, of course, be used. Into each glass drop one drop of solution of ammonia, and then two drops of a solution of oxalate of ammonia. The lime present is then thrown down in the form of a white oxalate.

Sea-water contains as much as three or four parts in a hundred of solid ingredients. The greater proportion of this saline matter consists of common salt (chloride of sodium). Sulphate of magnesia is also present, adding bitterness to the salt taste; and other compounds of potash, soda, and lime. The saline quality of sea-water renders it totally unfit for drinking. It will not quench thirst, but acts as a purge, and sometimes an emetic. Neither can it be used for washing with soap. As it stimulates the skin, baths of the sea-water are more invigorating than those of fresh-water. On account of its slow

evaporation, and the saline particles left behind, wetting with sea-water is not so likely to cause a cold as the same disaster with river or rain water.

The uses of water are so obvious—they are taught us by such unmistakable instincts (for the most part), that very little need be said of them.

Water, when drunk, becomes an article of diet. In our ultra-civilized town life, but very little water is ordinarily consumed in the pure state for the quenching of thirst. Tea or coffee takes its place at the morning meal, beer or wine at mid-day or dinner, and tea or coffee follows that again in the evening. These beverages, as far as they quench thirst, come under the same category as simple water. About three pints of fluid are necessary every day for the support of the animal functions. This is shown us by the fact that at least so much fluid is lost by the body each day in the liquid secretions and the vapour that passes off from the skin and lungs. Some persons drink too little. The secretions cannot then go on properly, and a tendency to gouty and calculous disorders is risked by such unwise abstention. It is better to drink even more than is wanted, to commit a fault on the other side, if fault it can be called from which no harm can result. In slight derangements—"colds," and tendencies to local inflammations—more serious disease may sometimes be warded off by the use of frequent and copious draughts of

water. This causes perspiration and diuresis, and tends to wash out the peccant matter by the depurating glands of the body. One may assert this without lending countenance to the extravagancies of the so-called "hydropathic" doctors, who cure all diseases by water. Much of the benefit of the watering-places to which invalids resort to drink of the springs in summer is explainable on this simple ground. In serious cases such treatment does little or no good. The change of scene, the simple diet, the early rising, and the exercise, which are customary as a part of this regimen, are of benefit to the valetudinarian by themselves. The salts contained in mineral waters assist their action on the glands. When they are purgative, they should be used with moderation and care. Chalybeate waters should only be drunk in those special cases in which iron is beneficial. (See next part of Work.) But it is in many instances the simple water to which should be attributed most of the benefit derived. And, with regard to this, even healthy persons may find it conducive to their comfort to drink every day a glass of cold water immediately on rising from bed.

Externally, water is used for purposes of cleanliness. Frequent ablution of the whole person cannot be too strongly insisted on. Not only is it so much a part of our daily life, that it is commonly enjoined as an almost religious duty; but there is absolutely

good reason for this faith in the fact that the use of water is necessary to prevent a choking of the innumerable pores of the skin by the particles of dust and dried perspiration which cling to them. This choking-up tends to arrest the perspiratory function, and is a fruitful source of disease. The use of soap, which combines with the oily matter on the surface of the body, and renders it soluble in water, helps the cleansing of the surface; but its too constant employment, to the face especially, makes the skin harsh. A cold bath taken every morning is found by many persons to promote the vigour of their frames, and secure them against fear of "catching cold." For the stout and strong it is an admirable thing. For delicate persons, in the chilly seasons of the year, a tepid bath, taken twice in the week, may be substituted. But let no person who wishes for soundness of body or full strength of mind omit to bathe himself continually at short intervals.

Warm baths are taken at a temperature of 90° to 100°, or more, according to taste. One hundred degrees is the temperature of the human body (or very nearly). A heat much above this causes pain and scalding. Warm baths are very different from cold baths in their effect on the system. They cause excitement at the time, a quickened pulse, rapid circulation, heat of skin, and sweating. But this effect is speedily followed by exhaustion, which is

greater according to the degree of excitement first produced, the time the person has remained in the bath, and the heat of the water. Continual warm bathing is enervating to both body and mind. It became a national custom with the Romans at the period of their commencing to decline as a people. Warm bathing affords an efficient means of cleansing the body when necessary. It may be used medically, to rouse the nervous system. It is also useful in checking an incipient cold, when it should be taken as hot as it can be borne, and warm clothing and brisk exercise should follow the bath.

Baths of sea-water, whether warm or cold, are more stimulating to the surface of the body than baths of fresh water. They are especially preferred in the case of children, women, and invalids. Persons should not bathe in the sea who do not experience a healthy glow and reaction soon after the dip. It is unwise to remain too long in the water, especially in cold weather.

I have adverted in passing to one sanitary use of water—its employment for cleansing purposes. There is another, of almost equal importance, its use in draining. It is important to the health of every house that such things as cesspools, privies, sinks with stagnant water under them, and so forth, should be utterly done away with. All superfluous and excrementitious matters that are capable of being washed away by water should be drained off by its

means into the public sewers. The supply of water must be constant and amply sufficient for this purpose. The drain-pipes passing from closet and sink towards the street sewer must be properly "trapped," *i.e.*, provided with a valve, which will prevent the passage of foul air backwards towards the house. The sewer itself must be laid with a proper "fall," continuing from the starting-point to the outlet into river or sea. It must be so large that it shall be incapable of being choked by the influx of rain. None of its contents should be allowed to filter into the soil, nor should its foul gases be allowed exit into the public streets. In fine, the outlet should be free and open, as far removed from human habitations as possible. If into the river, it must be one with a brisk current, and which is not resorted to for drinking purposes. When the river is a tidal river, and near a town, such a part of its course should (if possible) be selected to receive the sewage, as is sufficiently below the town to escape the washing back of the water as far as the town by the daily reflux from the sea. Upon such things, which are matters of common-sense, the health of the myriads of persons who live in towns and cities in great part depends.

In speaking of climate, it was remarked that one fault of the atmosphere of towns was its excessive dryness, produced partly by the heat of innumerable fires, partly by the absence of that exposed, evapo-

rating soil, which keeps the air of country places moist.

A horror of damp has become almost a characteristic of Englishmen. A marshy soil or stagnant water may, no doubt, be insalubrious; but, on the other hand, an excessive dryness of the air is certainly not conducive to health. The watering of the roads in summer supplies an artificial evaporation, which occasionally refreshes the sultry and thirsty air. Surfaces of water in the parks are of use in purifying the air, provided that they remain pure themselves, and are kept in motion by some sort of current. Open surfaces of water, on a smaller scale, in our chambers, will often be found healthful. Our apartments are apt to get over dry, as we might perceive from the difficulty which even the hardiest plants have in living in them, however carefully nursed. One of the *aquaria* so popular of late may enable us, at the same time, to supply this want in a room, and entertain ourselves, on a small scale, with the study of natural history, as set forth in the habits of aquatic creatures and the growth of water-plants. Care must be taken that the water in the aquarium do not become foul. There is a great danger of this in the salt water tank. Any dead creature must be at once removed. The fresh water aquarium will be found more manageable, and, if well arranged, quite as picturesque. It will be sure to thrive if these simple precautions are taken—to put it by the

window in a good light; not to crowd it with inhabitants; have at least an inch of earth at the bottom; and clear away the conferva as fast as it grows.

The uses of water may appear so simple that there was scarce any need to have set them forth; but, in a matter so essential to the preservation of health, it would not be right to run such a risk as that incurred by omitting to enumerate them.

In speaking of light, air, and water, I have had one lesson to enforce, one so simple that it is apt to be altogether lost sight of in the pursuit of more transcendental aims. This lesson is the same, though threefold. Have enough, and give enough—you can hardly have or give too much—of light, air, and water.

FOOD AND DIET.

It is a pity that man cannot live without eating, as the angels. However, to take food day by day is essential to our existence, for two reasons. Our body is constantly wearing away and perishing, and it cannot exist without internal heat. A molecular decomposition of the flesh and all the solid parts of the body is continually going on. There result from this a number of compounds which are of no use in the system, but would be very hurtful to it if they remained. The circulating blood permeating the whole system carries off these substances, and takes

them to the glands, which are the purifiers or scavengers of the body. Chief of these are the kidneys, and the glands of the bowels. They divide between them the work of separating from the blood these effete matters, which are then cast out. But this process, if allowed to go on alone, would waste away every tissue of the frame. To keep the parts whole, renovation must go on as well as destruction. So, for this, food is required to be taken constantly. This food is first reduced by mastication with the saliva. Passing then along the gullet into the stomach, it is gradually dissolved by the aid of the gastric juice, a thin acid fluid secreted by the mucous coat of the stomach. Such matters as are not dissolved by the stomach are brought into solution by certain other fluids in the upper bowel. A network of fine vessels lies outside the stomach and bowel. The dissolved food, penetrating the thin mucous membrane, passes into the interior of these vessels, and so obtains entrance into the blood. In the blood it is elaborated into compounds which resemble the living tissues. They are carried all over the body, and are taken by the flesh and other parts, being used by them to make up the loss occasioned by the decay just mentioned. When the parts are growing, as in the young, the supply is greater than the loss.

Nutrition, then, is one use of food. A particular part of the food, that which contains the four

elements (p. 91), is useful in nutrition, as it resembles the flesh in its nature. Another part, containing no nitrogen, is useful for the second purpose for which food is demanded. To maintain the animal heat at its constant standard a large amount of carbonaceous material is required. By the oxygen which enters the blood from the air breathed by the lungs (see p. 44), this carbon is slowly consumed, or burned, forming carbonic acid, and producing heat. To maintain the animal heat, from 8 to 10 oz. of carbon must be taken in the food daily. Pure charcoal would be of no use, as it is quite insoluble in water, and cannot be digested. Starch and sugar are both, especially the former, largely contained in bread and vegetable food. They contain three-sevenths or half their weight of carbon; the rest is oxygen and hydrogen, present in the proportion that forms water (8 to 1). So that they are equivalent to carbon and water. By their means carbon is supplied to the system, to maintain the respiratory or heat-giving process.

While an adult man requires 10 oz. of carbon daily for this purpose, he loses in the twenty-four hours about 5 oz. of his solid flesh and tissues. He thus requires this quantity of the nutritive or flesh-forming part of the food.

From these data we can at once calculate roughly the amount of food that is necessary to a grown man. Flesh, or meat, which represents one part of the diet, contains half its weight of water. Flour, con-

taining a large quantity of starch, represents the other element; it contains 15 in 100 parts of water. Nearly half of its starch consists of carbon. So we may give 10 oz. of meat, and 25 oz. of flour (for 10 oz. of carbon), daily. This is a close approximation to the dietary found necessary for persons fed at the public expense. But we are a little put out in the reckoning by the fact that flour contains some flesh-forming food itself, as well as starch. So that a man can live entirely on bread, while he could not do so on starch. A man, too, may live entirely on meat, but this involves waste, as the carbon of the flesh-forming element must then be burnt to a great extent, destroying what might have been applied to nutrition.

Food is generally divided into three classes, aqueous, nitrogenous (flesh-forming), and carbonaceous (heat-giving). The first comprises water and watery fluids. Water is necessary to dissolve the solid food, that it may be absorbed. It has to keep up the watery part of the blood and the tissues. It is also required for the secretions, in which a large quantity of water leaves the system daily (3—4 pints). A want of water causes the sensation of thirst. A starving man will feel this, on account of the loss by secretion. The food that we eat contains, on an average, half its weight of water. But more than this must be taken, either pure, or in the form of infusion of tea or coffee, fermented liquids, &c.

Having just given a *résumé* of the theory of solid food, I may speak now more particularly of the two kinds. First may be mentioned the simple carbonaceous food, next the simple nitrogenous food, then the compound food, consisting of both combined.

Starch and fat are the simple forms of carbonaceous food. Sugar resembles starch, but contains rather less carbon. (Starch is turned into a kind of sugar before it is absorbed by the stomach.) Starch consists of the three elements, carbon, oxygen, and hydrogen. The two latter are present in the proportion necessary to form water. The carbon constitutes about three-sevenths of the starch. Thus 20—25 oz. of starch daily will supply the carbon needed by an adult man. Fat and oil (which are similar) contain also the above three elements. The fats of the animal and vegetable kingdom are not the same in their constitution, but much resemble each other. Their average composition is 50 of carbon, 45 of hydrogen, and 5 of oxygen, by weight, in 100 parts. Thus they contain rather more carbon, and far more hydrogen than starch. Supposing nearly 1 part of the hydrogen to be taken by the oxygen in the fat to form water, we have 44 per cent. of hydrogen still, which may be oxidized, or burnt, by the oxygen of the air respired, to form more water, and produce heat. Thus, besides the carbon, we have nearly as much hydrogen as a heat-giving element. In fact, fat is 2½ times as efficient,

as a heat-giving article of diet, as starch. It is consumed for this purpose by the Esquimaux, who needs it so much. Those who can get bread, or starchy food, generally prefer it, because starch is digested with more ease than fat. Some of the fat in the food is supplied to restore the fat in the body, which decays, however, more slowly than the fleshy tissues. A man who is starving uses his own fat in feeding the respiratory functions. Animals which hybernate store up fat in the autumn, which they consume during their winter-sleep. Starch (contained in bread) is the chief respiratory element; fat is the other. 10 oz. of fat will go as far as 25 oz. of starch. Arrowroot, sago, and tapioca are pure forms of starch; potatoes contain 23 per cent. of starch, most of the rest being water; wheat flour contains 70 per cent. of starch and sugar, with nearly 15 of the nitrogenous element of diet.

The nitrogenous, or flesh-forming part of food, consists of the four elements, carbon, hydrogen, oxygen, and *nitrogen*. No food which did not contain nitrogen could possibly assist in the formation of any tissue but fat. Nitrogenous food is very regular in composition; in 100 parts there are 54 of carbon, 7 of hydrogen, 23½ of oxygen, 15½ of nitrogen. It contains more carbon than starch; but there is also more oxygen to combine with the carbon, if burnt. Thus this food, if given alone, would not produce so much heat as starch; and its

combustion is attended by a waste of the nitrogen which renders it so valuable in the formation o flesh. The proper use of nitrogenous food is nutri tion. The combination of the four elements is me with in three several forms; these are fibrine, albu men, and caseine. Their differences are supposed t depend on minute quantities of sulphur and phos phorus, which are combined with them.

Fibrine constitutes flesh, or meat. It is also tha part of the blood which coagulates into a clot whe the blood is drawn. If the blood which remains b heated, a further coagulation takes place. Thi coagulum is albumen. It is well known, also, a the white of egg. It occurs in many vegetabl articles of diet, as in wheat, when it is called gluter being left as a sticky mass when the starch is washe out. Another nitrogenous element is caseine, cor tained dissolved in milk, but precipitated from it b an acid. Caseine exists also in some vegetable seed as peas and beans. All of the three, albumer fibrine, and caseine, are equally useful in formin flesh and tissue. They are converted into one sul stance by the stomach, and afterwards moulded b the blood to the exact chemical condition of tl tissue which they are meant to renovate. A peculi form of nitrogenous food is gelatine, or glue. forms the animal part of bones, also skin, an (somewhat altered) tendon and cartilage. It is use to rénovate these tissues, but will not mal

flesh. It is contained in meat, soups, &c. Isinglass is a pure form of gelatine. It causes a considerable quantity of water to stiffen into a jelly.

Most of the solid matters eaten as food are compound in their nature, that is, they contain both the nitrogenous and carbonaceous elements. We may take as samples meat, bread, potatoes, milk, and eggs.

Meat, the flesh of animals, is the most nutritive kind of compound food. Beef and mutton, when raw, contain about half their weight of water. If lean, the remainder consists of nitrogenous compounds, fibrine and albumen forming four-fifths of these, gelatine one-fifth. The flesh of fish contains none of the colouring matter of red-blooded animals. Only one quarter of it is solid matter, so that its nutritive power is far less than that of meat from warm-blooded animals. Meat contains in its company a variable proportion of fat, which may be set down as one-fourth or one-fifth part. So that, speaking roughly, in 100 parts of meat, 40 will represent the nitrogenous element, 10 the carbonaceous. Meat is altered by cooking, of which I shall speak presently.

Bread is made of the flour of wheat, or one of the other *cerealia*. The average composition of wheat flour is 70 of starch (with a little sugar), 15 of gluten or albumen, and 15 of water. In making bread, one part of water is added for two of

flour. We must then take two-thirds of the above numbers to show the nourishing properties of bread. This will give about 46 per cent. of the carbonaceous, and 10 of the nitrogenous element. So that we have the proportions present in meat as nearly as possible reversed. In speaking of bread, I have *brown* bread in my mind. The husk of the grain is ground along with the grain to make this. This husk contains more gluten, more nutritive matter, than the white interior; the proportion being, in the husk, about 17, in the seed, about 12 in 100 parts. White flour is not only more expensive, but it is far less nutritious than flour in which the bran is ground. Yet the poor as well as the rich prefer white bread. The former even consider the recommendation to eat brown bread as a sort of insult. This is one of the matters in which the world has gone grievously wrong. Brown bread is not only more nutritive, but it is more digestible than white, and, if it were not from long habit, would probably be considered more palatable.

It is no wonder that bread is so popular and so universal an article of food. It contains the nitrogenous and carbonaceous elements in as nearly as possible the proportion needed to support life. That proportion, as we have seen, is about one to five.

This is not the case with potatoes, also a popular article of food, and one on which some contrive to

exist almost entirely. They contain three-fourths of their weight of water, 75 per cent. Of the 25 of dry matter, 23½ are starch, and only 1½ albumen. So that potatoes contain about one-half the carbonaceous equivalent of bread, and less than one-sixth of the nitrogenous.

I have said that an adult man requires daily 5 oz. of flesh-forming food, and about 25 oz. of heat-giving food. Now from this we may calculate at once the quantity of meat, bread, or potatoes necessary to support life. We will take the 5 oz. of nitrogenous matters as the starting point. For this will be wanted 12½ oz. of meat (which contains 40 per cent.) But here we shall not have enough of the carbonaceous element, so that without such an aid this meat will be insufficient. 50 oz., or about 3 lbs., of bread (10 per cent.) will be necessary to sustain life, and sufficient by itself. But we see that if a man eats nothing but potatoes (1½ per cent.) he must consume in the day, to maintain his life, no less a quantity than 21 pounds! He consumes, then, to get at the nutritive element, a large excess of the carbonaceous. This is the fault of all vegetable diet, except that which consists wholly of seeds (corn, peas, beans). This seems a flaw in the reasoning of those who recommend for our acceptance a strictly vegetable diet. 31¼ pounds of carrots a-day, 18 pounds of turnips, about 12 pounds of cabbages, would respectively be required to support life. But

3 pounds of bread would do it as well, and leave no excess of the starchy element. Peas and beans are most valuable articles of food. For they contain, when dry, nearly twice as much nutritive matter as wheaten flour. Lentils are somewhat more nutritious than peas. Lentil-flour is sold at an enormous price under the mask of such names as *ervalenta* and *revalenta*. Its value is from fourpence to fivepence a-pound. On one pound and three ounces a man would be sufficiently nourished, but he would require more starchy food.

Milk, though a fluid, may be mentioned here as an article of diet which is designed by nature for the sustenance of the young animal, and so likely to combine in an appropriate manner the two elements of food. Cows' milk contains about 13 per cent. of solids. Of these 4½ are caseine (which forms curd when coagulated), 3 are butter, and 5 a kind of sugar, not very sweet, called sugar of milk. The remaining ½ per cent. consists of saline matters. Thus, in cows' milk, we have 4½ of nitrogenous to 8 of carbonaceous food. In the milk of the human being the proportion is 2½ to 10, so that the milk of a cow must be watered down if given to babies. The milk of the ass resembles the last kind, but contains scarcely any butter. So that asses' milk is not so rich as to disagree with delicate stomachs, while it contains the nutritive element which makes it of use in promoting the growth of weak children.

About six pints of cows' milk in a day would sustain the life of a grown person.

The saline substances contained in milk remind us of the important fact that certain mineral matters necessary in our food to supply the mineral parts our flesh, blood, and bones. These minerals are salts of lime, magnesia, soda, potash, and iron. They are contained in fitting quantity in all our usual compound foods—in meat, bread, &c. Only one of them is ever supplied as food in a separate state. This is common salt, the chloride of sodium. (See Index of Remedies.) It is largely present in the blood and all the secretions. It is necessary to healthy life, and there is generally not enough of it in our food. This fact is known to all civilized, and even savage nations, who eat salt with their food. Persons who omit this salt must expect to suffer seriously in health.

The egg, like milk, is provided by nature as a food sufficient for a young animal. But the chick in the shell is not breathing the open air, and requires less carbonaceous food than the young mammalian. In the egg there is an *imperium in imperio*, a cavity within a cavity. The inner space, bounded by a membrane, contains the yellow yolk; the outer, a colourless, glairy matter, a mixture of albumen with water. The yolk also contains albumen. So, when boiled, both coagulate, the outer being called the white of egg. The whole egg contains about 15 per cent. of albumen. In the white the rest is

water (with some saline matter). But in the yolk we have besides about 30 per cent. of oil. The bulk of the yolk being at 1 to 2, or thereabouts, compared with the white, we have thus 10 of oil and 15 of albumen in 100 of the whole egg. We may then easily reckon from its weight the nutritive value of an egg (subtracting first one-tenth for the shell). The egg, not too hard boiled, is a simple and excellent article of diet. We perceive, however, from the above statements, how erroneous is the common saying, that an egg is as good as a pound of meat! Weight by weight, the egg contains the same proportion of the carbonaceous element, but we want 2½ times as much egg, or more, to equal the nutritive value of meat.

Supposing that we have now gained an insight into the positive value in feeding a man of the commoner sorts of food, we have next to apply our knowledge so as to arrive at a result as to the quantity and kind of food that a man ought to take. This will be useful to ourselves, and to others. To ourselves, because many men now-a-days are given to eating too much, when they can afford to pay for it. To others, because the poor who cannot afford are apt to put off themselves, or to be put off by others, on what is insufficient to maintain life. It is only lately that we have gained that elementary knowledge of the principles of feeding which I have just endeavoured to inculcate. Some time since a

luminous notion was started by a *savant* in France. The poor and prisoners, maintained at the public expense, cost a great deal in feeding. Would it not do to feed them on bones? Bones cost hardly anything, but, when boiled, they yield gelatine. And so the experiment was made; and, after many miserable creatures had died of starvation, it was admitted that human life could not be supported on gelatine. This was a magnificent blunder, a mistake on a grand scale. Errors of a smaller kind are continually perpetrated. How often do we hear persons—ladies especially—praising the nourishing properties of isinglass and jelly. I must repeat that gelatine feeds only the bones and skin of a man, and does not sustain the rest of his body at all. It cannot be made into flesh (fibrine, or albumen). Starch, which contains no nitrogen at all, which is only of use to be burnt, and support the breathing,—starch is sometimes talked about as if it were nutritious. Arrowroot is starch (so is sago, and tapioca). Yet I have known—and who has not?—sickly persons, who want nourishing more than the healthy, who can scarcely be persuaded to feed upon anything else.

I have said that a grown man might live on three pounds of bread alone, or six pints of milk alone. Also, that 12½ oz. of meat is enough to *nourish* him; but he will require some carbonaceous food in addition to this. On such simple facts, combined with the results of experience, have been founded the

dietary scales of gaols, hospitals, and workhouses. For men in health we allow something more than is absolutely necessary. For convalescents, we admit a still wider margin, for they have to recover the flesh lost in sickness.

Children should neither be over-fed nor under-fed. The latter proceeding is the commoner. Dr. Pereira ascribes scrofulous disease, and a high rate of mortality among children reared in workhouses, to the use of such meals as (so-called) pea-soup, and potato-pudding. The diet scale of the Foundling Hospital may be taken as a guide for feeding children. Children under nine years of age receive as follows: —For breakfast, 4 oz. of bread, and $\frac{1}{2}$ pint of milk, boiled with $\frac{1}{2}$ pint of water. For dinner, 4 oz. of meat, weighed uncooked, 6 oz. of potatoes, and 2 oz. of bread. For supper, 4 oz. of bread and $\frac{1}{4}$ pint of milk. The scale is liberal. Variety being of great importance, the meat is changed; it is roast, boiled, or made into soup; rice is substituted for potatoes, suet-pudding given, &c. For children at or above nine the bread at breakfast is increased to 6 oz., the meat at dinner to 7 oz., and for supper they have again 6 oz. of bread with $\frac{1}{2}$ oz. of butter or treacle.

A liberal scale of diet for grown men was that established for seamen in the navy in 1833. It comprises 1 pound of bread, 1 pound of fresh meat (or $\frac{3}{4}$ pound salt), $\frac{1}{2}$ pound of vegetables (or $\frac{3}{4}$ pound of flour), and a gallon of beer daily. There are given

besides 1 oz. of cocoa, $1\frac{1}{2}$ oz. of sugar, $\frac{1}{4}$ oz. of tea each daily; and oatmeal and vinegar, $\frac{1}{2}$ pint each, are given weekly. When salt meat, without fresh vegetables, has to be eaten, an addition has to be made. Lemon-juice is served out to prevent scurvy.

Fresh vegetables are ordinarily eaten by landsmen, because cheap and pleasant additions to their daily food. I have not spoken pointedly of them hitherto, because considering food only as necessary to life. Potatoes contain a good deal of starch. Other fresh vegetables contain but little. They are as little nutritive as the potato; and they consist in great part of water. But they also contain small quantities of certain vegetable acids (citric, tartaric, &c.), which, for some unknown reason, renders them useful in maintaining health. A person who never eats fresh vegetables is sure to get out of health, and is apt to become afflicted with scurvy, unless, indeed, as seamen do, he takes lemon-juice or citric acid to supply their place.

The sense of hunger, which causes a demand for food, should be appeased by a meal, but not replaced by satiety.

Men endeavour so to mix, vary, and prepare their food, as to render it more easy of digestion, and to make of the necessary process of eating, which else would be a task, a pleasure, by gratifying the sense of taste.

The object of cooking is to soften the food, and

adapt it for being easily dissolved by the digestive fluids. Mechanical division is necessary, in the first place; meat is cut, corn is ground to a powder. In the next place the agency of heat is resorted to. We may apply to a piece of raw meat the dry heat of a fire or oven, or the moist heat of water. Meat contains albumen, fibrine, much water, and the red colour of the blood. Roasting a piece of meat first coagulates the albumen near the surface. The fibrine, which constitutes the fibre of flesh, is swollen and softened by the heating and expansion of the water within it. This action on the albumen and fibrine spreads inwards with the heat. The red colour is changed to brown, and, when this has taken place throughout, the process is completed.

Anything which enables food to be more easily divided facilitates digestion, for before a matter can be dissolved in the stomach it must be reduced to a pulp. Meat cooked by roasting can be bitten easily by the teeth; raw meat is exceedingly tough. The effect of broiling is similar to that of roasting.

Boiling consists in cooking a joint through by the agency of boiling water. The process may be contrasted with the process of making soup. Here we want the solid meat, there we want the liquid. As albumen and many parts of meat are soluble in water, we must take care here to prevent them from being extracted. We must get the water to boil first, and then plunge the joint into it. The result

is that the albumen near the surface is instantaneously coagulated, forming an impermeable barrier which prevents the juices of the interior of the joint from running out into the water. However, long boiling will disintegrate and partially dissolve the meat, and boiled meat is hardly so nutritious as roast.

In making a soup or broth we want the fluid, and have to get as much as we can out of the meat, so we adopt a very different procedure. The meat is first cut up into a number of small pieces. These must then be macerated for several hours in cold water. The juicy parts run out to a certain extent, and are further extracted by very slowly raising the heat, and allowing the mixture to simmer for some time. Boiling for a few minutes will then suffice, unless we wish thoroughly to dissolve the fibrine or stringy part, which is seldom desirable. To extract gelatine from bones very long maceration and boiling is requisite. Vegetables in soups had better be softened first by separate boiling. Peas and flour are used to thicken soup and render it nutritious. It may be asked here, how can the nutritive part of meat be contained in soup at all, considering that albumen is insoluble in boiling water and fibrine in water hot or cold? Only the gelatine is soluble of all the nitrogenised constituents of meat. This question has puzzled wiser heads than ours. The answer is, that the albumen first, and then the

fibrine, are gradually decomposed during the maceration and heat into a soluble nitrogenous substance, called osmazome, which possesses nutrient properties. Albumen unchanged may be present in soup, forming flakes, which ought not to be separated by straining. Soup on cooling is apt to form a jelly on account of the gelatine which it contains. But that which forms the stiffest jelly is not therefore the best soup. It may contain much gelatine but none of the albumen and osmazome, which are far more useful in nutrition.

Besides roasting, boiling, and making soup, there are other forms of cooking called baking and frying. Meat prepared in these ways is less wholesome. When baked, the part nearest the hot oven is burnt or decomposed, and the whole mass is impregnated with the products of this burning. Frying is objectionable for a similar reason. The fat or oil employed in the process is changed by the heat into a number of peculiar chemical products which all physicians agree in pronouncing to be highly indigestible. The same empyreumatic results are produced by the baking of pastry, formed of fatty matters and flour. "All pastry," said Dr. Paris, "is an abomination." The digestions of healthy persons will enable them habitually to surmount greater difficulties than this; but to weakly individuals, and dyspeptics, pastry is certainly hurtful. Omelets, pancakes, all fried or baked substances

containing much fat, are objectionable for this reason. For children, who are fond of sweet things, puddings are to be preferred to pies and tarts. Mixtures of barley, rice, sago, &c., with milk, eggs, and sugar, may be baked without harm.

Wheat and other flour is rightly cooked by baking, being first mixed with water (2 to 1) to make dough, then fermented with yeast which causes it to rise (changing its sugar into carbonic acid and alcohol), and lastly baked in the oven. Salt is a harmless ingredient of bakers' bread, but alum, if put into white bread, as it generally is, does much harm to those who eat it, tending to cause costiveness. Of brown bread as preferable to white, and of the nutritive properties of bread in general, I have already spoken. (p. 91.) Other ways of causing bread to rise have been recommended as preferable to fermentation. Carbonic acid may be generated in the mass by mixing in first carbonate of soda, then hydrochloric acid; or it is produced by mixing the dry flour, before adding the water, with *baking powder,* which consists of tartaric acid (dry) and carbonate of soda (dry). Various combinations of flour with sugar, currants, butter, &c., form, when baked, biscuits and cakes. Biscuits and cakes which contain no butter are the wholesomest.

Flour mixed with water, and baked in thin layers, as in biscuits, is wholesome. With a large mass this cannot be done, or, if done, the product is

heavy and indigestible. So some method of causing the particles to separate and the whole mass to lighten is necessary. In bread we have a light spongy mass generated by the copious production of carbonic acid by fermentation. I am not aware that any harm is done by this process, or that fermented bread is at all less wholesome than other kinds of bread. Very good bread is now made in London by forcing air into the dough, but the process is protected by patent. New bread, however baked, is bad for dyspeptic persons.

For convalescents and weakly persons—mutton or beef, boiled or roasted, chicken, rabbit, pheasant, white fish (sole or whiting) are to be recommended, with soups, broths, light puddings, &c. To the same persons—pork and veal, goose and duck, salmon, eels, herrings, cured fish and shell fish (except the oyster), peas and beans, walnuts, filberts, and almonds, all fleshy fruits (except oranges, grapes, and strawberries), but especially all things baked and fried which contain fat, should be forbidden. When sweet things cause acidity their use should be but sparingly allowed. Beer as a drink, generally wholesome, may cause flatulence. Brandy and water, or a dry sherry, should be substituted.

The times for taking food should be regular. To take food at all manner of times, like the savage who lives by hunting, and must fast till he has caught his prey, is not conducive to health. The

digestive organs are much under the influence of habit, and will obey a call upon their activity when it is made at a period to which they have become accustomed. Three meals a day, breakfast, dinner, and a light meal in the evening, are sufficient for many persons. This is the natural method of dividing the food. If all taken at once, the stomach would be loaded at the time to such an extent as to render digestion most difficult, and before the recurrence of this one daily meal the system would be likely to suffer from exhaustion. Many dyspeptics are made by the custom of eating largely at dinner and but little at other times. They might be cured if they could be prevailed on to take food at shorter intervals, and in smaller quantities at a time.

On rising in the morning the body is peculiarly susceptible to morbific influences until food has been taken. Breakfast should, therefore, be taken soon after rising. This meal should not be a heavy one, but just substantial enough to satisfy the appetite —no more; otherwise, the eater is unfitted for the duties of the morning. Bread (better not new) with a little meat, and tea or coffee, suits most persons. These liquids, or substitutes for them, are in such universal use among civilized nations, that it is clear they must supply some want very widely experienced by men in modern times. The good they do I believe to be referable to their power of removing fulness of the head, caused by congestion of the

brain, and thus making a man light-spirited, and apt either for bodily or intellectual exertion, especially the latter. Now-a-days the upper and middle classes live chiefly by work of the mind, and beverages which remove an incubus which weighs upon and impedes its activity are naturally popular with them. It is quite a mistake to call tea and coffee stimulants. Stimulants are medicines which quicken the rate of the pulse. It is by diminishing this, and reducing the force of the heart that tea and coffee relieve the pressure on the brain, and so clear it for action. They are in reality sedatives. This is their danger. Green tea and strong coffee will sometimes cause irregularity of the heart, giddiness, and faintness. Even when such symptoms are not experienced, the too copious use of tea and coffee will cause nervousness, sleeplessness, and dyspepsia. Tea, I think, is wholesomer than coffee. Neither should be drunk too strong, or in too large quantity. Not only are they useful in diminishing congestion of the brain, which makes people stupid in the early morning. They are taken after dinner and in the evening to prevent or diminish the congestion which is apt to be produced by the digestive system while labouring at the disposal of the most substantial meal of the day. Many persons are incapable of intellectual exertion for some time after dinner. This incapacity may or may not be aggravated by wine. A full meal by itself will often produce it.

To lessen it a cup of coffee, taken after dinner, is an admirable institution.

The poor are accustomed to dine soon after mid-day. A time of five hours from breakfast is the most natural period for eating. Children, especially, should dine then, and all women who can do so conveniently. Men, however, in the higher and middle-classes are either so occupied till late in the day, that they have no leisure to eat, or find that a heavy meal renders the afternoon useless to them. That dining in the middle of the day makes men stupid and sleepy in the afternoon is an argument against the practice, the cogency of which we must all admit, however prejudiced we may be in favour of the Arcadian custom. Thus it is that it has come to pass, that most people take, about the middle of the day, a meal called lunch. Some persons make this an excuse for dinner. Any one who eats largely at both eats more than is necessary. Either take a substantial lunch and a light dinner, or a light lunch and a good dinner. Those who do the former can well afford to dine late, at an hour when our ancestors supped. A dinner at eight or nine o'clock is really a supper. However fashionable the hour may be, it is a most improper one for those who get little to eat at midday. Beer, which is tonic as well as stimulant, and wine, which is simply stimulant, are both good in moderation. Young persons can do without them, and so can robust adults, especially

women. The practice of dining late so overtasks the digestive powers that more wine than is necessary is apt to be drunk, to goad the stomach into action, or pacify its discontented spirit. This is one evil of dining too late. Dyspepsia, in all its forms, may result from so unnatural a custom. Another evil result is that the evening is practically lost; the most enjoyable part of the day being spent frequently in a kind of social intercourse which is anything but intellectual in its character.

On grounds both theoretical and practical, I recommend to those who wish to preserve good health and good spirits some such arrangement as this for the hours of meals:—A light breakfast, from eight to nine o'clock. For lunch, a sandwich, between one and two. Dine at five, if possible; if not, as soon as you can after the occupation of the day is over. Take tea, without eating, about an hour after dinner, resting between. Exertion after dinner interrupts digestion. Lastly, before going to bed, again take a sandwich, or something equivalent to it. Between five and eleven there is time for complete digestion, and few persons can sleep well with the stomach perfectly empty. Heavy suppers are bad; they cause bad dreams, nightmare, a coated tongue, and sense of lassitude in the morning. Supper may be altogether dispensed with by those who dine very late.

Of all things, the most necessary to remember is,

not to eat too much. Over-eating degrades a man into a brute. On many parts of the continent of Europe, the practice prevails of taking three heavy meals each day, of many various dishes of complicated cookery, washed down with copious libations of sour wine and strong coffee. Such a manner of living is in every way destructive of health.

Good manners, no less than philosophy, teach us not too eat too quick. The division of the food by the teeth, and its mixture with saliva, is necessary as the first step in healthy digestion. Moreover, if too much food is suddenly introduced into the stomach, the organ is so swollen out, that the gastric juice is not rightly secreted, and flatulence results instead. Children should be taught to eat slowly and deliberately, and chew their food well.

As to the use of fermented liquors, no general advice can be given, except that excess should be avoided. Each person is the best judge of his own requirements as to these dietetic stimulants. Some stand in need of them, others do not want them at all. (See Wine, and Alcohol, in Index of Remedies.)

EXERCISE.

Under this head there are no particular precepts to be laid down. The truth which I have to state is one universally admitted, but not always acted upon. The proper development of the muscular

system is essential to the health of the body, as well as to the activity and usefulness of the individual. To procure this development one only thing is necessary—that each and all of the muscles of the body should be continually exercised. In this age of artificial work, machine labour, luxury, and scientific locomotion, some persons give way to their natural or acquired indolence to such an extent as to seem to have forgotten the use of their legs and arms. But all persons who enjoy tolerable health owe it mainly to the fact that they take exercise continually. In most forms of exercise, the muscles of all the limbs and the trunk are brought into play. In the three common methods of locomotion—walking, riding, and rowing—this is the case. But in walking, the legs are chiefly used; in rowing, the arms; in riding, the legs, trunk, and arms are variously brought into play, according to the manner and speed. During physical exertion, the muscles become stronger and stronger, and increase in bulk as in power. Familiar illustrations of this are found in contrasting the arm of a smith with that of a student, the leg of an opera-dancer with that of a coachman. The limb that is used much is brawny and strong, that which is disused is weak and puny. In our common forms of exercise we gain an additional advantage in the exposure to air and light that accompanies the act of locomotion. Swimming is a kind of exercise that adds to the benefit derived

from the healthy and bracing action of cold water on the surface of the body. Being hard work, it cannot be indulged in long. Where there is water and leisure, rowing with a pair of sculls is an admirable form of exercise, about the best that could be invented. Rowing with one oar pulls a man rather on one side, and, being performed in company, adds the excitement of competition, which is not healthy, except for the very robust. Rowing matches have been known to produce disease of the heart, from an overstrain of the muscles. The same danger, but far less in degree, attends on over-walking. It exhausts a person, instead of doing him good. A good test is this: when a man is not so tired as to lose his appetite, his exercise does him good; when he cannot eat after it, it does him harm. Moderate walking, at a tolerable rate (say about three miles an hour—not more than four), for some distance every day, does more than any one thing that could be named to keep a man in health. Five miles a-day is the minimum that I should fix for young men; ten miles a-day is not too much. Ladies must judge for themselves how much they can bear without fatigue. Students know well that they cannot read with advantage unless in good health. Young men at college are so addicted to what is called among them a "constitutional" walk, that it has become with most of them a regular daily institution.

Our ancestors made provision for their health by

engaging in a number of athletic sports, which, in an age given to trade, have been one by one resigned in subservience to certain falsely-utilitarian notions. Thank Heaven! they are not all gone. Cricket and football, hockey, curling, tennis, quoits, and skating provide for the physical education of youth, and give grown men an opportunity of scientific diversion. With these latter, when they can afford it, field sports are more in vogue. The angler lives rather a lazy and contemplative life; but the Member of Parliament, when he tramps the moors after grouse or red-deer, may manage, under the stimulus of the chase, to walk further in a day than a soldier in a forced march. Exercises of this expensive kind, shooting and hunting, are not open to all classes. The young men who are busied in trade, in occupations of a sedentary nature, in our large towns, require exercise all the more for being engaged in such employments. They find it hard to get opportunity for recreation and healthy muscular work. Fortunately, there has been a wide movement lately among employers in favour of giving them a holiday of a clear half-day once a-week. I should recommend such men (and women) to choose a healthy lodging in as airy a district as possible, to walk to their work in the morning, and back from it in the evening, and to devote Saturday afternoon to some healthful recreation or employment in the open-air. Those who have

joined our Volunteer Rifle Brigades have gained thereby a most admirable opportunity of physical training for the muscles, have shown at once their patriotism and their good sense, and, while they serve the Queen, are serving their own limbs too, and securing, by the best means, their rightful allowance of manly strength and beauty.

Gymnastic or calisthenic exercises are of use both to young and old. The skilful teacher will know how to bring out into its right proportion a particular set of muscles, or to strengthen a limb that has suffered from the undue development of another. The various deformities which are caused by muscular action may be easily checked when only incipient. The round shoulder, the stoop, so common in persons of sedentary occupation, especially when near-sighted or over tall, should be early attended to, as it tends to contract the chest, and fosters disease of the lungs. Walking in a studiously erect posture, drilling, rowing a pair, drawing weights over a pulley from behind downwards, are means of combating this deformity. A projection of the shoulder on one side is common in young and growing girls. It occurs from too much stooping to write, or from working too much with the hand on that side. Sedentary study should be discontinued for a time, and means invented for employing the left arm as well as the right. Young girls who ride much are sometimes thrown on one side by it. The little

girl should either leave off riding, or have a side-saddle so made that she can ride on the right side sometimes instead of the left. Swinging from a hand-swing, or being taught to climb up a knotted rope (with worsted twisted round it) suspended from the ceiling of the nursery, will often be of use to children who are weak in the spine, as the weight of the body when hanging helps to straighten the back. This climbing exercise is much recommended by Sir B. Brodie.

The muscles of the larynx, on the action of which the voice depends, are as capable of improvement by exercise as any of the muscles of the body. Not only is the voice itself developed and rendered skilful by practice, but the lungs—the organs of breathing—being called into active play by this exercise, the health of the system at large is benefited by it. Singing and speaking aloud are both in this way conducive to health. I believe that many a clergyman and many a public singer have been saved by the exigencies of their employment from early death by consumption. Without any notion of vieing with Lablache or Malibran, the members of private families may, with the greatest advantage as well as pleasure, cultivate the delightful art of singing, in which every person, I think, whether male or female, ought to strive to excel. Part-songs afford an opportunity of many uniting for this purpose, and were, for this good reason, as well as for their merit

and effect, held in high esteem by our ancestors, who were far more musical than we are—(not meaning by musical "going to the opera," and so on, but taking part in it one's-self).

After exercise comes rest, which should be rightly proportioned to it. Sleep—perfect rest for at least eight hours—makes up for the exhaustion of the day-time, and renews both body and soul for their work next morning.

Exercise of the mind is as necessary for the development of its natural powers as exercise of the body. It should be regular, and not excessive or protracted, especially with the young. It should be varied in kind, lest it produce weariness. In the right regulation of exercise of the mind the science of education is concerned.

PART II.

ON THE RESTORATION OF HEALTH.

I. INDEX OF DISEASES.

THE understanding and cure of disease is naturally more in the province of the medical adviser, less in that of the public at large, than is the science of preserving health while not seriously impaired. Yet I think it by all means better that men should make the rudiments of so momentous a subject a part of their education, as they do the principles of many sciences of far less moment to them, than that they should be so ignorant of it as to be unable to understand the nature of any disorder which it may need a skilled person to cure, or to appreciate his motives in the remedial measures which he may think it best to advise. It is not well that they should be presumptuous on the strength of knowing something. It is the wholly ignorant who are presumptuous, and fall easy victims to pretenders to medical science. A

little knowledge will teach its possessor how much there is that is yet unknown to him, and yet make him more than a match for those empirical priests of nature who have not been initiated into her mysteries. I have no wish that any who read this book should aspire to *doctor* themselves, as the phrase is. I wish them to render, as I said at first, an intelligent co-operation to the physician in the necessary treatment of their disorders. Also, in the absence of ready medical aid, it is desirable that those who are the friends and counsellors of the poor should be put into the way of rendering them some relief in their many woes, or at least saved from doing them harm.

I have thus, as simply as possible, and in as few words, endeavoured to give some account of the more ordinary forms of disease. This account must, of necessity, be incomplete, but it will not, I trust, mislead. I have omitted those forms of disease which are rather matters of curiosity than of common occurrence. I have also kept myself from questions of pure surgery and of midwifery, disorders which are beyond my immediate province, which should not be treated by any but a skilled person, and which, if included, would have enlarged my book beyond all reasonable bounds.

The treatment of the various disorders is here indicated by a mention of the remedies that are to be used. On turning to the second chapter of this

part of the work, those remedies will be found, alphabetically arranged, and, with each, forms and prescriptions for their convenient and safe employment.

ACIDITY.

Acidity of the stomach is connected with indigestion, gout, rheumatism, &c. It is often accompanied with flatulence, a tendency to vomit, and loss of appetite, and generally causes pain, either in the region of the stomach (behind the ribs on the left side below) or higher in the chest. Alkaline, bitter, and carminative remedies counteract it. Such are ammonia and soda, calumba, and ginger.

Acidity of the urine is common in catarrh, and rheumatism, and gout. It tends to cause a yellow or red deposit, even a calculus, if long persistent. Alkaline remedies, effervescent draughts, Rochelle salt, and copious draughts of water, are beneficial in such a case. (See Gout, Gravel, Calculus.)

AGUE.—See Fever, Intermittent.

AMENORRHŒA. *Retained menses.*

The monthly affection of women commences about fifteen and ceases about forty-five years of age. It

ceases also during pregnancy, and more or less during lactation. In pale girls, with flabby limbs, and deficient strength, it is often retained. The treatment consists in the preparations of iron, aloes or other purges in moderation, good living, air, and exercise. (See Anæmia.)

Anæmia. *Paleness. Green sickness of women.*

The blood contains a number of red globules, seen by the microscope, which give it its colour, and impart the natural glow of health to the surface of the body. They form properly twelve parts per cent. of the blood. But in this disease, which depends on defective nourishment, low constitutional power, or loss of blood from any cause, they may fall as low as ten or even eight per cent. The skin is then very pale, the tongue pale, the conjunctiva of the eye white. The patient is languid, indisposed to exertion. The secretions are scanty, and unnatural in colour. Anæmia is frequent in young persons. It may be connected with a scrofulous tendency. If in girls, as is commonest, they may be hysterical, and the menstrual secretion will be deficient.

The red globules contain iron. Iron, given as a medicine, tends to increase their quantity. Iron, therefore, is the best remedy in anæmia. It is called a tonic, but is not of use in debility without paleness. The carbonate, ammonio-citrate, sesquichloride, or sulphate, may be used—not in too large doses.

Good living, wine, ale, or porter with dinner, exercise in air, and plenty of light, are above all necessary.

Anasarca.—See Dropsy.

Aneurism.

A pulsating tumour, caused by the rupture of the wall of an artery. It stops beating when the artery above it is firmly pressed. A most dangerous disease, imperatively requiring the attention of a skilful surgeon.

Aphonia. *Loss of voice.*

This may be complete or partial. Its most frequent cause is inflammation of the larynx. The simplest form of this is sore-throat, from a common cold. Put flannel round the throat, keep the patient from cold, and on low diet; at bed-time bathe with hot water or apply a mustard poultice; give a mild purge, and occasional draughts of nitric ether and chlorate of potash. More serious inflammation, with ulceration, may arise from syphilis, or in the course of consumption. For the former, apply a blister about the size of a shilling, and give iodide of potassium; for the latter, see Consumption.

Hoarseness or loss of voice may be caused by over-exertion of the organ in singers or public speakers, and is so common in clergymen as to be named after them. (See Dysphonia Clericorum.)

APHTHÆ. *Thrush.*

An eruption of white specks, which run together, on the mucous lining of the mouth and throat. It is common in young infants. The membrane may loosen in patches, or ulcers form. There is frequently at the same time irritation of the stomach and bowels. The mouth should be frequently rinsed, and honey of borax applied. Castor-oil may be given to open the bowels, and wine and support where sloughing occurs.

APOPLEXY.

The attack consists in a sudden effusion of blood on the surface of the brain, beneath the membrane which separates the brain from the skull. The minute vessels give way on account of that degeneration and weakening of their walls which occurs in advanced life. The pressure of the effused blood on the brain causes the loss of sensibility and other symptoms of apoplexy. The attack happens in old persons, men most commonly. It is preceded generally by some headache, thick speech, and confusion of ideas. If promptly treated by a brisk purge, it may go no further than this. The stroke may occur suddenly; the patient falls insensible. His neck should be bared, his head raised, his forehead bathed with cold water, mustard-poultices applied to the feet. The fit is distinguished from epilepsy by the age and history of the patient, the

rareness of convulsions, and the absence of the scream on falling. From concussion or shock it is known by the pulse, which here is full, in the case of concussion feeble or imperceptible. The patient, after a variable time, recovers from the apoplectic fit, and it is then found usually that he has lost the use of the arm or leg (or both) on one side of the body. The power of speech may be lost, the muscles of the face affected. When the throat is involved, and the power of swallowing impaired, there is great danger. But in most cases, after some days or weeks, the power lost after the stroke gradually returns. When this does not happen, the limbs being permanently palsied, rigid, or flaccid, and wasted, there is a softening of the brain going on which cannot be remedied, and which was the cause of the giving way of the vessels in the first instance.

Temperate and active habits, moderate indulgence in food and stimulant drink, may save a man from apoplexy, or postpone the seizure. Gout and rheumatism, diseases of the heart and kidneys, dispose to it, and should be met by appropriate treatment whenever perceived. Colchicum and blue pill may often ward off an attack. Bleeding during the fit is not to be advised. There is seldom immediate danger. To feeble persons give stimulants. To others administer brisk purges, which more than any other medicine relieve the brain when overgorged with blood. The pulse will show how much

the patient can bear. When insensible, a drop of croton-oil placed on the tongue will prove efficacious. (See Paralysis.)

ASCARIDES.—See Worms.

ASTHMA.

Attacks of difficulty of breathing, occurring in paroxysms. It may be produced by disease of the heart, and can then only be alleviated, not cured. A fit of common asthma generally comes on in the night. There is difficulty of breathing, lasting some time; the patient sits up in bed, and breathes hard with a wheezing noise; his face may be livid or very pale; he seems threatened with suffocation. In the morning the attack goes off, with some expectoration of mucus. At night it returns, for several times running. Some persons are peculiarly subject to asthma; sometimes a dry climate suits them, sometimes a moist; the smoky atmosphere of towns agrees best with some. The smell of hay brings on in certain persons a kind of asthma with coryza. To plethoric persons tartar emetic or ipecacuanha may be given. Generally, especially for the weaker, opium in moderate dose is prescribed with a stimulant, ammonia, ether, nitric ether, &c.

BLADDER, INFLAMMATION OF.

This may be caused by injury, by cold, the irritation

of calculi, stricture, &c. When acute, there is pain with soreness on pressure in the region of the bladder; the urine being voided frequently, with difficulty, and in small quantities at a time. For the treatment a warm bath, fomentations, emollient and laxative clysters, and opium, may be prescribed. Dover's powder at night and castor-oil at morning may be combined.

When chronic, as sometimes happens in old persons, or results from gonorrhœa, there is a frequent discharge of mucus with the urine, which smells of ammonia. Pareira or buchu, with nitric acid, should be given.

Bleeding.—See Hæmorrhage.

Bowels, Inflammation of. *Peritonitis. Enteritis.* There is fever, with acute pain in the belly, increased by pressure. The patient lies in bed with his knees drawn up. There is costiveness, nausea, or vomiting, great prostration. Death may take place, preceded by cessation of pain, caused by gangrene. The substance of the bowels themselves may be inflamed, or the fibrous tissue which covers them (peritoneum), or both. Inflammation of the mucous lining may occur alone, and is less dangerous. It causes diarrhœa. (See Diarrhœa.) When the bowels are opened in peritonitis, it is a favourable sign. Calomel and opium should be given repeatedly, or, in mild cases, castor-oil.

Brain, Inflammation of.

This very serious disorder is common in children. (See Hydrocephalus.) In adults it may be produced by injury, by the poisons of the eruptive fevers, by intemperance, by *coup de soleil,* or by excessive mental toil and anxiety.

It is a disorder which most urgently requires the advice of the skilful physician.

There is high fever, terrible pain in the head, intolerance of light, sleeplessness, delirium. In the second stage there is an effusion of the products of inflammation on the surface of the brain or in its substance. The pulse becomes slow, the pupils are dilated, there is deep insensibility, or sometimes convulsions. Death, palsy (of various kinds), or perfect recovery, may be the issue. Some recommend leeches behind the ears. It is better still to shave the head, and keep a bag of pounded ice constantly applied to it. Give calomel, three to five grains every two or three hours, for many times running. (Do not give opium in any affection of the brain.) A saline mixture may accompany and succeed the calomel. Darkness is necessary at the height of the fever; silence and quiet, until recovery.

Breast, Diseases of.

The breasts of women are liable to many disorders, the commonest of which are due to the irritation caused by functional disturbances.

Inflammation of the breast may occur from injury, but generally from too sudden weaning of an infant, or allowing the breasts to be overdistended during nursing. There is sharp, shooting pain and shivering, with fever, often extensive hardness of the organ, with swelling and redness. It may go on to the formation of an abscess, which points at the surface, and may discharge so much matter as to cause great exhaustion.

Mild cases may be cut short by applying wet rags covered with a handkerchief, and emptying the breast by sucking or drawing. Give a dose of castor-oil. When throbbing indicates matter forming, it must be encouraged by poulticing. As soon as perceived, it must be let out by lancing, cutting in a line from centre to circumference, and not across the breast.

Irritable breast may occur from similar causes, or from any uterine irritation. It is common in young girls. There is a hard and very tender lump at some part of the organ, often consisting of a small portion of the mammary gland. Warm fomentations will relieve pain; the general health should be attended to.

Cancer of the breast occurs mostly in women past middle life. If not removed early by the knife it proves fatal. There is first a small tumour under the skin in one of the breasts. This is subject to occasional attacks of sharp lancinating pain. It gradually spreads, involving the substance of the breast gland, and drawing into it the skin. So long

as the mass can be moved, or the glands in the armpit are not swelled, there is hope of cure by the knife. But by degrees it attaches itself to the ribs beneath. On the surface it breaks into a foul open sore. The glands in the armpit (which communicate with the breast by the lymphatics) swell next and become affected with the same disease. Next comes cough, pain in the interior of the chest, and expectoration, due to an invasion of the lungs. Meanwhile the sore increases, and by one or other of these disorders the patient at length dies. If removed early the patient may live for some time. But there is always a risk of its return at the same spot. Two or three successive operations have been performed on the same woman. No caustic or other agent is of any use in this terrible disease. The popular and quack remedies for cancer are an imposture.

BRIGHT'S DISEASE. *Degeneration of the Kidneys.*

Several distinct forms of kidney disease are included under this name. They frequently commence in an attack of inflammation of the kidney, with shooting pain in the loins, and fever. Some months or years afterwards the patient is attacked with a train of symptoms, the chief of which is general dropsy. The result is death. The kidney is then found changed in structure. The secreting cells are gone from the kidney tubes, and the organ is

shrivelled, or, more commonly, gorged with fatty deposit. During the course of this disease there are in the urine microscopic rows of cells which have come from the kidney tubes, and there is albumen in the urine, which becomes thick when heated with nitric acid. A diaphoretic * regimen may prolong life, but the disease is incurable.

Bronchitis.

An inflammation of the bronchial tubes, the passages by which the windpipe communicates with the air cells of both lungs. A mild form is called catarrh. An attack of acute bronchitis lasts several days. There is fever, pain in the centre of the chest, a sharp cough, and expectoration of mucus, at first clear and viscid, in the later stage thick and creamy. Inflammation of the bronchial tubes may accompany consumption, pleurisy, pneumonia, or occur in fevers, rheumatism, &c. A simple attack is traceable to a cold. It becomes chronic sometimes, especially in old persons, as a "winter cough." The acute form may be treated with brisk purging and sweating, calomel and opium, or tartar emetic. Chronic cases, without fever, with ipecacuanha, alkalies, squills, nitric ether.

Calculus and Gravel.

Gravel signifies a deposit in the urine. If the urine is

* See Diaphoretics: Index of Remedies.

passed clear, and becomes thick on cooling, it is of little moment; the cause is a cold, or indigestion. But when passed it may contain a yellow or red sediment (soluble in an alkali), or even small stones. This state of things may end in a calculus in the kidney or bladder. There may be attacks of acute pain shooting from the loins forward, with painful micturition, and other unpleasant symptoms. Stone in the bladder may cause pain, aggravated by motion, painful passage of urine, sometimes bloody, and occasional stoppage. It may require a surgical operation. There are various kinds of stone. Gravel and calculus of the yellow or red kind, with acid urine, require alkaline remedies, and are generally associated with gout.

Cancer.

A malignant or cancerous growth may occur in almost any part of the body, but is commonest in the breasts of women, in the womb, in the stomach, and liver.

Cancer of the stomach causes pain opposite the organ, with a hard tumour, vomiting of a bloody mucus, gradual emaciation, and death. A tumour may sometimes be felt. Cancer of the liver may cause a tumour below the ribs on the right side with persistent jaundice, and at length death. Cancer is known from other tumours by its growth, which cannot be restrained, its spread to neigh-

bouring parts, and the glands in the course of the absorbents, its involving instead of displacing the tissues, pain, and tendency to form an open sore. There is no cure but removal, and that is doubtful, for it very frequently returns. (See Breast, diseases of.)

CEPHALALGIA.—See Headache.

CATARRH. *Cough.*

A mild attack of bronchitis. There may be slight fever. There is cough, sometimes in paroxysms, mucous matter is expectorated, the rest disturbed, the appetite impaired. It is produced by exposure to cold, and generally accompanied by coryza, "cold" in the head. A checked perspiration is a frequent source of catarrh. It is only serious in very delicate people. The dress should be made a little warmer, flannel worn next the skin, the patient stay in doors for a day, and, if robust, go without wine, &c., and live on broths and slops. Give a mild purge; promote perspiration, as by warm drinks at night, or give ipecacuanha, Dover's powder, nitric ether, &c.

CHAPS AND CHILBLAINS.

Chaps are sore places occurring from irritation of the skin, of the hands chiefly, in cold weather. An unguent, as cold cream, may be frequently applied, or glycerine (which see). Honey and borax is a good application.

Chilblains are inflammations of the skin at promi-

nent points of the toes and fingers, frequent in cold weather. They go deeper, and are more serious than chaps. An iodine lotion is a good application, or nitrate of silver, touching them lightly. Stimulating and astringent ointments are used, but they are not of much use.

CHICKEN-POCK.

A contagious eruptive fever, of a mild nature, generally occurring in infancy or childhood. For twenty-four hours there is slight fever, then an eruption of red pimples appears. It is on the back first, but spreads to the face and rest of the body. On the third day the pimples are vesicles, which break on that or the fourth day. About the fifth day the eruption is gone, leaving no scars or marks. (The vesicles are not pitted as in small-pox, nor does matter form in them.) Rest, and a gentle aperient, form all the treatment desirable in most cases. When convalescent, the child may take a warm bath.

Neither with this nor with other eruptive fevers can any distinct rule be laid down as to the duration of infection in the person or clothes of the convalescent. The bath will remove much of the danger from the former, but it can hardly be considered to have passed away (in scarlatina, &c.) before three weeks have elapsed. The clothes should be aired, washed, if possible, or exposed to a heat of about

200°. The floors should be scrubbed, the ceiling and walls limewashed, the windows thrown open, solution of chloride of lime sprinkled about, to render the apartment safe.

CHOLERA.

A severe form of summer diarrhœa, with bilious vomiting and cramps, has been called English Cholera. (See Diarrhœa.)

Asiatic Cholera is a terrible epidemic scourge, which has visited this country several times in this century. It is believed to have come originally from India; it is introduced at some seaport town; whence it spreads inland, proving most fatal where the population is the most dense and unhealthy. It depends upon a subtle poison which is communicated by air or water. Whether cholera is contagious is matter of dispute. At all events the local and atmospheric circumstances which give it to one man are likely to affect any other person who may be in the same place.

At first there is generally some looseness of the bowels, lasting for hours or days, causing no pain and little inconvenience, so that the patient who is stricken with the deadly disease is altogether unaware of his danger. *Directly* this diarrhœa is perceived, a dose of rhubarb and magnesia, with peppermint, should be given. This may be followed by chalk mixture, continued until the purging ceases. This

premonitory diarrhœa is very much under control; the disease may easily be arrested at this stage, but at a later period it is too late in many instances to prevent the fatal termination. Those who watch over the poor in such a time will do well to remember this. By a knowledge of this fact hundreds of lives were saved in the great epidemic of 1849. In country, as well as town districts, the number of medical men is too small to exert a sanitary supervision over the whole population; part of this labour will, therefore, devolve upon clergymen and other non-medical visitors of the poor.

The premonitory diarrhœa is sometimes too quickly succeeded by the second stage of the disorder. The patient seems suddenly struck down. There is faintness, sickness, cold perspiration, and profuse purging, of matter which at length resembles water. There are next severe cramps of the muscles of the belly and limbs. The watery discharges go on, the patient is thirsty, the urine is scanty or retained, the skin becomes cold and blue, the pulse is feeble, scarcely felt, quick; the patient speaks in a whisper, and at length dies exhausted, or insensible. Or if he gets better, some fever precedes recovery. At the commencement of an epidemic, and towards its end, many cases of cholera that have reached the second stage recover, but in the middle period, when it is at its height, most die. Fatal cases only last from six to twenty-four hours.

It is probable that good sanitary regulations, household cleanliness, and the best water supply for towns, will prevent the return of cholera, or at least mitigate its violence. The manner in which cholera is propagated being doubtful, those who are at any time concerned with the sick of that disorder are advised to be scrupulously cleanly, and to abstain from eating or drinking in the neighbourhood of a patient's room.

As to treatment, many remedies have been vaunted, but most are worthless, and owe their reputation to having been used with apparent success towards the end of an epidemic, when the poison has lost its power. It has just been remarked that cholera may, apparently, be treated with success if discovered at the very outset, when there is simple diarrhœa. When "rice water" purging, as it is called, has come on, the danger is most imminent. Half a drachm of dilute sulphuric acid in a wine-glassful of water with five drops of laudanum should be given every two hours. (Some recommend calomel in grain doses every hour, but I do not find that the evidence is such as to encourage us in this method of treatment.) When the purging is stopped the patient must be kept quiet, and supported. If the last symptoms, those of collapse, appear, the feet should be stimulated with hot water bottles, and a bag of hot sand applied to the stomach or loins. Draughts of hot wine and water,

plenty of it, should be administered till the patient is roused. Then recur to the acid treatment again.

Too frequently all our attentions are of no avail.

CHOREA. *St. Vitus' Dance.*

It occurs chiefly in young girls of seven to fourteen years of age, and of delicate organization. Twitches of the face and rollings of the eyes generally come first, and next a constant involuntary movement of the arm or leg, or both, generally of one side more than the other. The patient walks and speaks with difficulty, and the natural sleep is interfered with. The treatment consists in restoring the health by a preparation of iron, as the ammonio-citrate, with ammonia or a tonic. The living should be generous; as much fresh air allowed as possible, and costiveness of the bowels remedied by an occasional dose of castor-oil.

COLIC. *Cramp in the Belly.*

There are various forms of colic. There is usually griping and twisting pain of the bowels, with tendency to retraction of the muscles about the navel. It is relieved by pressure, and thus distinguished from inflammation. The bowels are generally costive; there is much flatulence, and a tendency to vomit. It may be caused by cold, or by unwholesome food. The colic of painters is caused by the poison of lead. The treatment of ordinary colic consists in a purge (senna, castor-oil,

aloes, blue-pill), with a carminative (peppermint or ether), and alkali (ammonia, soda, or magnesia). Hernia (a rupture) should not be overlooked. In painters' colic give sulphuric acid, alum, or sulphate of magnesia.

CONSTIPATION. *Confined Bowels.*

A tendency to constipation is natural to many persons. Instead of resorting to purges it is better to make some change in the diet. A glass of cold water may be taken every morning on rising, brown bread eaten instead of white, pastry abjured, and free exercise taken on foot. Castor-oil, aloes, and senna, may be taken when positively necessary. A constipated condition, if suffered to continue, is highly injurious to the health of body and mind. The bowels should be acted on once in every twenty-four hours. Sedentary pursuits and a town life dispose to constipation.

This condition also occurs in most acute diseases and inflammations. This is the reason why a purgative of some sort generally forms a part of the treatment of such disorders. Obstinate constipation may cause colic (which see), or may issue in diarrhœa. It is a symptom of hernia, or protrusion of the bowel, which may be known by the existence of a soft tumour in the groin, which protrudes with a jerk when the patient coughs. The hernia must be returned, or serious consequences may result.

A furred tongue, headache, hypochondriasis, loss of

appetite, accompany constipation when suffered to continue.

This condition, when occurring in pregnant women, must be treated by gentle purges only, as castor-oil.

CONSUMPTION. *Phthisis. Tubercular Disease of the Lung.*

This disease consists in a decay of the tissues of the lungs, commencing in a deposit of tubercles in the air-cells.

In weakly and scrofulous persons, especially the young, there is a tendency to the formation, in various organs and tissues of the body, of a peculiar morbid product, often of the colour and consistence of cheese. It is first in small round nodules, which cause irritation or inflammation of the parts which they infest. In certain places they increase in size, and run together into a mass. This mass cannot organize into healthy structure; sooner or later it decays and softens, breaking down into a yellow semi-fluid, mixed with pus. Minute tubercles on the membranes of the brain cause hydrocephalus in children. On the membranes of the abdomen, they occasion the chronic peritonitis, or mesenteric disease of children. In the glands of the neck, they cause enlargement and scrofulous inflammation. In the joints they cause scrofulous disease of the joints, which is commonest in the hip and knee. In the former this condition is known as hip-disease. It produces inflammation, followed by

abscess of the hip-joint, destruction of the head of the thigh-bone, shortening of the leg, and, ultimately, fixing of the hip-joint.

Tubercular deposit in the lung-tissue, filling up the spaces of the air-cells, constitutes consumption, the commonest and most fatal form of tubercular disease. First is noticed, probably in a delicate subject with pale clear complexion, thin habit, and narrow chest, a short dry cough, most troublesome on rising in the morning, at length habitual. The patient is easily fatigued, flushes with slight exertion, experiences difficulty of breathing on ascending stairs or heights. There is some slight mucous expectoration, and there may be attacks of spitting of blood. The most constant of all the symptoms is the rate of the pulse, which continues steadily at about 100 or more in the minute. The pulse of the adult in health is from seventy to eighty. Whenever the pulse is *constantly* above ninety, consumption may be suspected. Temporary increase of rate is producible by many other disorders.

This is the incipient, or first stage. The tubercle is deposited now to some extent in the upper parts of both lungs, behind and just under the collar-bones, but is still solid.

The second stage may come on in some weeks,—more commonly months, or even years elapsing. The cough is now worse, and the expectoration, which is frequent, is loose, yellowish or grey in

colour, often mixed with semi-solid lumps, or streaked with blood. Attacks of hæmoptysis may occur again. The pulse is quicker and weaker, the breathing shorter. Attacks of fever (hectic), with a bright circumscribed flush in the cheek, occur each evening, going off with a profuse sweating towards the morning. The voice is hoarse, and there is often ulceration of the larynx. There are pains in the chest, often sharp, and due to attacks of slight pleurisy. There is diarrhœa, often to a dangerous extent, and owing to ulceration of the bowels from tubercular deposit there. The tongue is red, the appetite may continue good, but the patient loses flesh and strength in a marked manner. And so, by degrees, he becomes weaker, and at length sinks and dies. It is a very fatal disease. The patient may last some time, and get over several attacks. But those seldom recover in whom the disease has not been successfully treated in its first onset.

The second stage consists in the softening of the tubercles, the suppuration and gradual destruction of the lung-tissue which they involved. By this a cavity or hollow space in the upper part of the lungs is formed. This cavity continually increases, and a great part of the breathing organ may be destroyed, before death terminates the havoc. Physicians judge of the state of the lung, and the progress of the disorder, by employing two physical tests, invented by the Frenchman Laennec. These are—percussion

and auscultation, *i.e.*, striking, and listening. The first consists in striking sharply with the points of two fingers of the right hand, on the back of one or two fingers of the left hand placed flat against the part of the chest to be examined. A moderately resonant sound is elicited from the healthy chest, on account of the hollow spaces of the air-cells. When the sound is dull there is a solid beneath, probably tubercle. In the second stage there may be a cavity, and there is unnatural resonance. Auscultation may be performed by applying the ear closely, or by the medium of a wooden conductor, called a stethoscope. During consolidation, instead of the soft murmur caused by natural breathing, there is a sound as of air passing along a number of narrow tubes. These are the bronchi, the sound being conducted from them by the solid between. The voice when the patient speaks is unnaturally loud from the chest to the ear. In the second stage (cavities) a blowing or gurgling in a hollow space is perceived, and the voice seems to come from the chest as loudly and distinctly as from the mouth, or more so. This is called pectoriloquy. Another physical sign is the diminished capacity of the chest for air. The patient, on taking the deepest breath he can, is made to hold his nose, and breathe out to the fullest possible extent through a tube into a hydrostatic measure, called a spirometer. Even in incipient phthisis the amount breathed out is far smaller than in health.

In health the capacity of a man five feet seven inches high is 210 cubic inches, and eight cubic inches more must be added for each additional inch in his stature. Any great deviation from this standard indicates disease.

Treatment.—Much more may be done in preventing than in curing consumption. The prophylaxis (or treatment beforehand) consists in all means that strengthen the system, and the avoidance of causes of ill-health and weakness. An hereditary predisposition, or a scrofulous constitution, powerfully tend to produce it; and in such cases we should be on our guard. Plenty of fresh air and constant active exercise out of doors are the best preventives. Want of fresh air and exercise will bring on phthisis in many persons who might otherwise have escaped it. Mechanics, needle-women, clerks, and students, whose employment keeps them sitting indoors, are thereby in greater danger than others. The practice of injudiciously "coddling" children weakens their health, and renders them liable, like delicate plants, to be withered by the first breath of cold wind to which they are exposed. Consumption is most frequent in young persons whose physical education has been thus mismanaged. Well ventilated rooms make healthy children; close ones turn them out feeble and scrofulous, destined to die before their time. The athletic sports of childhood and boyhood should be encouraged by all manner of means.

No moping over books, no late hours should be allowed; better let the mind lie fallow till it is fitted to receive instruction by the vigour of the body. Good food and sufficient meat must be given. When older the youth must be taught to keep up the same discipline. He must avoid late hours, and all kinds of dissipation; be encouraged to walk much, to row, play at cricket and foot-ball. Mental excitement and excessive toil are bad. The clothing should be sufficiently warm; not tight, but loose; thin flannel should be worn next the skin.

When a tendency to the disease is suspected, cod-liver oil affords us an important remedy. It cannot do harm, and may do much good. It should be regarded less as a medicine, than as a regular addition to the diet. Commence with a teaspoonful thrice daily, and increase it gradually to a table-spoonful or more each time. The first repugnance to it is soon overcome in most cases. When the patient grows fatter upon it, it is a sure sign that benefit is derived. Tonics, as iron and quinine, may be given in small doses occasionally. The digestion must be carefully attended to. But the oil must be given constantly if it is to do good.

When the disease has appeared, but is still in the early stage, cod-liver oil is still our mainstay. Many cases have been arrested by it, numbers of lives saved. If fresh tubercles can be prevented from forming, the wounds caused by the old ones will heal

up, and the patient recover. At this period removal to a seaside place, with bracing air, will do much towards restoration.

At a later period, when hectic occurs, change of climate may still do good, though recovery is hardly possible. Life may be prolonged now by a warm, equable climate, as that of Torquay, Hastings, the Undercliff, or Madeira. The bracing air which at first would have restored health, at this stage does positive harm.

For the rest, the treatment is now concerned in the alleviation of symptoms, and the diminution of suffering. Pain in the chest may be relieved by small blisters over the part. Cough, by opiates, ipecacuanha, squill. The hectic flushes, by cooling saline drinks, as of nitre. The sweating and diarrhœa, by dilute sulphuric acid, acetate of lead, logwood, or catechu. The same astringents, and a cooling diet, relieve hæmoptysis. In excessive diarrhœa, with sickness, broths and farinaceous diet must be substituted for solid food. Towards his end, the patient will require to be sustained by stimulants, as ammonia, chloric ether, wine, brandy.

A number of quack remedies, inhalations, rubbings, and so forth, have been vaunted as cures for consumption. None of them have any efficacy, and the patient who puts his trust in them will find, when it is too late, that he has been miserably deceived.

CONTUSIONS. *Bruises. Sprains.*

A local injury which does not rupture the skin, or break a bone, is called a bruise when the surface only is hurt. It is a sprain when the tendons or muscles are injured, so that motion causes pain. A bruise is followed by redness, and then lividity of the skin. Pain, in any case, may be relieved by fomentations of hot water, or decoction of poppies. The lotion of arnica has a good effect in removing the consequences of a bruise. A sprain requires rest.

CONVULSIONS.—See Epilepsy, Hysteria, Tetanus, Hydrophobia.

CONVULSIONS OF CHILDREN.

These occur in delicate children at the period of teething. Spasmodic croup, or the crowing respiration of infants, with turning in of the thumbs and toes, is a peculiar form of convulsion. Mild cases are best treated by a teaspoonful of castor-oil, and attention to the diet. A teaspoonful of brandy, in a wineglassful of water, may be drunk by the infant during the day. Lancing the gums is sometimes necessary. In a severe attack the child may be immersed in hot water up to the shoulders, and cold water dashed on the face and head.

CORYZA. *Cold in the Head.*

This is produced by external cold, or repressed perspiration. It is often accompanied by catarrh

(cough). There is some fever, redness and watering of the eyes, and a running of mucus from the nasal cavities. It occurs in some persons in summer, at the time of mowing the hay. (Sea air is the remedy for this.) Flannel next the skin, and a diaphoretic regimen, will cure a cold best. Nitric ether, with chlorate of potash, or acetate of ammonia, may be prescribed, and a warm draught at bed-time.

COUGH.—See Catarrh.

Cough is a symptom, also, of inflammation of the lungs, pleurisy, consumption, &c.

CRAMP IN THE STOMACH.—See Acidity.

CROUP.

It occurs chiefly in young children. It is different from spasmodic croup (see Convulsions). There are paroxysms of difficulty of breathing, with a long shrill sound at each inspiration. The attack goes off with cough and some expectoration. When severe, a membrane forms in the windpipe, which it is very difficult to dislodge; the pulse is quick, the face becomes livid or pale, and suffocation may ensue. An emetic (tartar emetic or ipecacuanha) should be given at once, and followed by repeated small doses of the same medicine. A warm bath may be joined with this treatment. The room must be kept warm.

Cynanche.—See Quinsy.

Delirium Tremens.

Delirium (hallucinations, visions, and wandering of the mind) occurs as a symptom of disease of the brain, in fever, and in acute diseases attended with fever. It may be caused by poisons, as belladonna and henbane. Loss of blood, or any cause of exhaustion, may occasion it.

Delirium tremens is the peculiar delirium of drunkards. It is generally caused by continual and prolonged drinking, but may follow a single instance of excess. There are hallucinations without incoherency. The patient sees all manner of frightful objects at night. At day his hands tremble, his skin is moist and pale, his eyes wander, his pulse is feeble, he has no appetite. He cannot sleep. Madness may result from it. This disorder is called the "horrors" by poor people. Abstinence from excess, and an amended life, must be enjoined, or even enforced, for some drunkards are mad. The habitual stimulant should not be given up suddenly, but by degrees. (This disease is often aggravated on "taking the pledge.") Opium must be given to procure sleep, and the constitution reinvigorated by tonics, as quinine, and iron. A purgative regimen forms a part of the treatment in most cases.

Diabetes.

An excretion of sugar in the urine, large quan-

tities of which are voided in the day. (The healthy amount is about two pints.) The urine becomes brown when heated with solution of potash. Its specific gravity is from 1.030—1.040. (In health, 1.016—1.020.) The skin is dry, the bowels costive, the health suffers, and the patient wastes away. As little bread or sugar should be allowed as possible, bran bread being preferred. The diet should consist chiefly of meat, fatty matters, milk, and eggs. Codliver oil, ammonia, opium in small doses, and astringents, may be prescribed. The disease may be kept in abeyance, but seldom cured.

DIARRHŒA. *Bowel Complaint.*

Excessive action of the bowels occurs in cholera, and in one kind of fever.

Ordinary diarrhœa consists in pain in the belly, followed by frequent loose evacuations from the bowels. There may be sickness, flatulence, loss of appetite. When excessive it forms English Cholera. In colic and inflammation of the bowels there is constipation.

When diarrhœa is excessive, the evacuations become watery, or the food may pass undigested. It is always best to begin the treatment with a purgative (castor-oil, senna, rhubarb, or magnesia) to enable the system to clear off the matter which irritates the intestines. If the disorder continues, chalk

mixture, opium, or astringents, must be resorted to.

Unwholesome food, or hot weather, may cause it.

Diphtherite.

An epidemic complaint, which has proved very fatal of late years, especially among the lower classes, and to children. It affects the throat and larynx, and may kill by passing along the windpipe into the lungs. There is some fever, sore throat, a husky cough; a white tenacious membrane forms on the mucous membrane of the fauces, and spreads to the larynx. Death may occur from gangrene of the throat, from suffocation, or by the great exhaustion which is produced. The throat should be touched pretty freely with nitrate of silver, or hydrochloric acid or alum used. Wine and support must be freely given; ammonia, chloric ether, and quinine during convalescence.

Dropsy.

A swelling of parts produced by an exudation of serous fluid from the veins. When in the limbs, the surface pressed with the finger leaves a small pit for a moment. Dropsy may occur in the arms or legs, or fluid may collect in the peritoneal cavity of the belly. Dropsy is caused by stagnation of the circulation, owing to obstruction at any part of the system. The cause of obstruction may be

disease of the heart, generally traceable to acute rheumatism; or disease of the kidney, generally Bright's disease; or disease of the liver, mostly occasioned by spirit-drinking.

Dropsy from heart disease commences in arms and legs together, gradually involving the whole body.

Dropsy from kidney disease commences in the feet and legs, spreading thence gradually upwards. The urine in both cases contains albumen, and becomes thick and white when heated.

Dropsy from liver disease affects first the abdominal circulation, causing dropsy of the belly (ascites), which swells, and gives evidence of containing fluid. This may be emptied out, when no longer bearable, by the surgical operation of tapping.

Swelling of the legs to a slight extent is common in delicate women, and relieved by lying down. A form of kidney dropsy, which may be cured, may occur after scarlatina. But general dropsy is due, in most cases, to organic disease, as just mentioned, a state of things which must, sooner or later, prove fatal. Death generally occurs from the feebleness of the heart, which at length ceases to act; it may be caused by an extension of the dropsy to the lungs, or an affection of the brain.

Diuretics and diaphoretics are resorted to, to lessen the amount of fluid, or increase the urine, which is always scanty. Blue pill and squill form a valuable combination. Gin, which is diuretic, forms a good

stimulant drink. Brisk purges, as colocynth, croton oil, elaterium, are valuable means of clearing the system of the fluid.

Dysentery. *Bloody Flux.*

Acute dysentery is produced by a kind of malaria, and is most frequent in tropical climates, as India. It commences with fever and shivering; there are then straining and painful evacuations from the bowels, scanty, and mixed with mucus and blood. It requires change of air, calomel, and opium, to subdue the symptoms; then ipecacuanha, and quinine. If not cured, it becomes chronic, the evacuations being continual, and still containing mucus and blood. Castor-oil may be given at first to produce a healthier action, then acetate of lead, kino, or catechu, to repress the discharge.

Dyspepsia. *Indigestion.*

A disorder common in the sedentary inhabitants of towns, and more frequent in the rich who have no active occupation. A heavy feeling after each meal, a furred tongue, dainty appetite, constipation, loss of sleep, flatulence with eructations, occasional pain in the stomach, and low spirits, are the chief symptoms. The cure is rather hygienic than medicinal. Exercise, work for body and mind, removal of causes of anxiety, abstinence from unwholesome food, late dinner, and

suppers, taking food by small quantities at a time, and a judicious use of stimulants (as bitter ale or dry sherry) may remove it. The state of the bowels must be attended to. Tonics and alkalis may be required. Dyspepsia is often associated with a tendency to gout.

Dysphonia Clericorum. *Clergyman's Sorethroat.* Over exertion of the voice produces a chronic affection of the throat, known by this name. There is rarely any very active inflammation; if there be, some other cause may be suspected. The throat is red, there is some difficulty in swallowing, the tonsils and uvula are swollen, there is hoarseness of the voice. The disorder, if allowed to continue, may become very intractable.

It is more easily prevented than cured. Young clergymen too often use their voice, for the first time in public, in a space to which they are unequal; they use it too often and too long, and strain it by the injudicious employment of high notes, or by reading in a monotone. Instead of this, the voice should have been much practised beforehand. It should have been gradually inured to a large space by commencing in a small schoolroom, and trying it by degrees in apartments of larger size, as opportunity offers. It will then be prepared for the work, the difficulty of which is ill understood by those who have not experienced it. The voice should not be used

too constantly at first, or for too long a time in one day. With regard to the time of speaking, a tolerably obvious hint may be given. Divide the labour, if possible; it is better to do a service in the morning, and preach a sermon in the afternoon, after lunch and rest, than to perform both together. Again, as to straining the voice. Speaking clearly, with a distinct enunciation of each syllable, is much better than speaking too loudly. If the furthest man in the church is seen to listen, the rest will be sure to hear you. If one had to choose between the two, I am sure that speaking too low is better than speaking too loud. Fortunately, the fashion of violent pulpit declamation has disappeared before an amended taste. In society it is considered vulgar to speak too loudly. In a different sense it is so in the pulpit. Those who are laid up with sorethroat after a needless waste of the powers of that great gift of God, the human voice, have only themselves to thank for it. Then as to tone and modulation. Change is good for many reasons; and I would suggest a variety in loudness, continually changing, according to the subject a preacher may have in hand. To this simple device many popular preachers owe most of the attractiveness of their delivery. Every one knows that the effect of a sermon on the auditory depends at least as much on the delivery as on the matter. It is a great mistake to resort too much to very high or falsetto notes; they are very trying to the voice, and

bass notes are not only easier, but far more effective. As to tone in general, of course it will be infinitely varied to express the sentiment of the speaker. The voice, even in speaking, is an exquisite musical instrument. As the wind, according to its force, strikes various chords out of an Æolian harp, so the emotion of the speaker should affect the voice. Denunciation, warning, entreaty, terror, and pity, have each their peculiar tones, without which they utterly fail in import. Some persons of eloquent words are disregarded in the world because they lack the persuasive accents which, better even than arguments, carry conviction to the souls of men. And yet some preachers will deliver the whole sermon in a monotone. This may exhibit to advantage one particular note in the voice; it may even gratify the eccentric taste of some persons boasting a musical ear, who care more for B flat than they do for theology; it reminds others of the strange, droning noise which continues when one of the stops of the organ is left out by mistake after that instrument has ceased to play. I am not speaking at all of intoning the service, but of intoning the sermon, which is a very different thing. Clergymen who cannot manage the voice will do well to take lessons in elocution before they have acquired a fixed habit of mismanaging it, which they will find it extremely difficult to eradicate. I must not be tempted into a treatise on elocution here. I have spoken of it simply be-

cause I am persuaded that good elocution tends to the healthy cultivation and preservation of the voice. And the golden rule of elocution is—Be natural. Read as you would speak. Consider in yourself sometimes during your sermon whether you are doing this, whether you would yourself listen attentively if an auditor instead of the speaker; whether the tones you are using are the tones most likely to carry conviction to the hearts of those present. I think it is a great compliment to a preacher when one of his hearers declares afterwards that he did not know whether he were reading or speaking. Not that it is not impossible to acquire a vicious and unnatural habit of extemporaneous discourse. Some utterly incorrigible persons, instead of reading as they would speak, will speak (in the rostrum) as they would read, doing both artificially. This habit is acquired, few doing this at first. Let any one try it at home, and he will be able to judge of the ridiculous effect produced by an artificial delivery. Order the dinner in a monotone, and observe how the cook will stare, thinking her master must surely have taken leave of his senses.

A vicious elocution is bad for the voice, because it exerts it in a tone to which it is unaccustomed. It must be avoided, if it be wished to preserve the throat from injury.

Prevention, as I said, is easier than cure. A slight touch of sorethroat may be remedied by a mustard-

poultice. The throat should be inured to cold and hardened from the first, by exposing it as much as possible; this will strengthen it. When the tonsils are swollen, iodine lotion may be used externally, or a solution of nitrate of silver (strong) applied to the tonsils themselves. At the same time, rest is required for the voice, for a longer or shorter time, according to the severity of the ailment. In slight cases, change of air to a moderately-bracing but not irritating climate, sea-bathing, with continual bathing of the neck in salt water, may be recommended. More aggravated affections are benefited by the soft, mild air of the Undercliff, Torquay, or Madeira. The solution of the mixed acids (see Nitric Acid) may be taken internally for some time. Alum sometimes does good, and bark, or quinine. The same treatment applies to similar throat affections, however and in whomsoever produced.

ENLARGED GLANDS.

Enlargement of the lymphatic glands of the neck occurs in young persons of a delicate constitution, or scrofulous tendency. They may inflame or suppurate, sometimes leaving disagreeable scars. Where they are not yet painful, tincture of iodine lotion should be applied to reduce the swelling. When much inflamed, poultices must be resorted to. Quinine and iron, cod-liver oil, or iodide of iron, should be given internally. Sea-bathing and fresh-air are desirable.

The glands in the armpit may enlarge as a consequence of cancer in the breast. The glands of the groin may swell and suppurate as syphilis (bubo). Swelling of the glan jaw occurs in mumps.

EPILEPSY. Falling Sickness.

The fit of epilepsy is distinguished from other fits by a sudden loss of consciousness. The patient falls with a loud cry. While insensible, he is generally violently convulsed, the face is distorted and livid, the tongue bitten, there is frothing at the mouth. After a while he recovers. There is a tendency in the fits to recur; there may be many in one day, or the intervals may be long. Weak health, disease of the brain, excessive mental or bodily excitement, are causes. Insanity may result, or an accident happen from a fall. During the fit the neck must be bared, and the patient kept from hurting himself. Afterwards, the health must be invigorated by tonics, change of air, good food, purgatives. Sulphate of zinc and nitrate of silver are recommended.

EPISTAXIS. *Bleeding from the Nose.*

This is common in young persons and some adults. It is generally due to some fulness of the circulation in the head, which relieves itself naturally by a giving way of some of the small veins in the mucous lining

The common form of this disease is an inflammation of the skin, caused by cold, constitutional debility, or the impure air of hospitals and gaols. In the latter case it spreads from a wound, and is often serious or fatal. It is commonest on the face; there is diffused redness, becoming pale on pressure, and a puffiness of the surface. There is fever, with burning of the part, on which at length small blisters may form, discharging a yellow fluid. If it involves the brain or lungs, it may prove rapidly fatal, causing great exhaustion. The part should be covered with wet lint, and this with oiled silk. Give castor-oil at first. Support the patient with wine or brandy. Administer quinine, or tincture of sesquichloride of iron.

FEVERS, ERUPTIVE. See Chicken-pock, Measles, Scarlatina, Small-pox; also Fever, Typhus.

FEVER, INTERMITTENT. *Ague.*

malaria, or emanations from the ground in damp, low-lying, and unhealthy districts. There are three stages in each fit. First cold, with shivering, chattering of the teeth, &c. Secondly, the hot stage, high fever, and burning, dry skin. Thirdly, the sweating stage, with which the attack goes off, leaving much weakness. After a certain time, generally on the alternate day, the same fit recurs. This is a tertian ague. Other kinds recur daily, or every third day, &c. The attacks, if not attended to, may go on for a long time, the spleen becoming enlarged, the patient sallow and emaciated. All diseases occurring with distinct intermissions are supposed to be due to the ague poison. Neuralgia is the commonest of them all. Bark or quinine, given in full doses during the intermission, is the best remedy. The bowels should be attended to meanwhile.

Fever, Remittent.

This is a more severe form of epidemic, produced by similar causes to those of ague. Aggravated remittents occur in tropical climates, but those of England are much milder. The symptoms of fever are more marked than in intermittent, but the successive stages are less clear, and the fever, instead of intermitting at distinct periods, passes off after a variable time, and then recurs.

While the fever lasts, salines, diaphoretics, and mild purgatives (mercurial, or castor-oil) should be

given, with rest and low diet. When there is a distinct remission, with moist skin and soft quiet pulse, quinine should be administered cautiously. A kind of remittent in children may occur during teething, or from any intestinal irritation.

FEVER, SIMPLE OR INFLAMMATORY.

Fever is a state of the circulating system which may be caused by any constitutional or local irritation. Specific fevers are caused by the entrance of peculiar poisons into the blood, and are frequently communicated by contagion. Such are ague, or intermittent fever, remittents, continued or typhus fever, and the eruptive fevers—scarlatina, measles, small-pox, chicken-pock. They are separately mentioned. Any local inflammation will cause an attack of simple fever, which is severe or not according to the cause which occasioned it. Mild cases occur in a common cold or cough, in children from disorder of the bowels or teething. Severe forms are produced by inflammation of the lungs, brain, liver, or a large surface of skin. Fever is preceded by headache or a sense of weariness. There is thirst, loss of appetite, the bowels are disordered (generally confined), the urine is high-coloured, the skin hot and dry, the tongue coated. The pulse is quick and full. There are attacks of shivering, followed by burning heat. Perspiration is a favourable sign. It should be promoted, as by draughts containing

nitre, acetate of ammonia, nitric ether, &c. A mild purge should be given at the outset. A kind of fever coming on at evening, and leading to sweating (hectic), is produced by wasting disorders, as consumption.

FEVER, TYPHUS. *Typhoid. Continued Fever. Low Fever.*

This kind of fever is distinguished from agues and remittents by continuing without remission until recovery, and by the presence of an eruption. It differs from other eruptive fevers by being far less regular in its symptoms, and occurring in several dissimilar forms, described by medical writers. Fever is infectious; it may last days or weeks, ordinarily for about a fortnight; it may occur more than once in the same person.

The period of incubation is not fixed. The disorder is ushered in, like small-pox, with pains in the head, back, and limbs, and shivering. There is extreme prostration of strength. A man may now appear as if intoxicated. Sometimes some days pass, the tongue being coated, the appetite gone, before the fever developes itself. The pulse at length is quick and full, the skin burning and dry; there is throbbing of the temples, flushing of the face. The patient is confused in his mind. He has bad dreams in his snatches of sleep. He may be delirious. The tongue becomes dry and brown. Early in the case

diarrhœa is apt to set in, which becomes more aggravated as the disease advances, and may of itself carry off the patient. Towards the end of the first week there may be some spots like those of measles on the chest and belly, or red specks like flea-bites may be scattered over the body. The patient cannot move now without assistance. In favourable cases he improves towards the middle or end of the second week, and by degrees recovers. In other cases, instead of this comes the second, or typhoid stage, characterized by utter prostration of body and mind. The sufferer is helpless, lies with his mouth open, can scarcely speak or move, requires to be fed, the limbs and tongue tremble, there is low, muttering delirium, picking at the bedclothes, the excretions pass away involuntarily, the pulse can scarcely be felt, there are thick crusts on the teeth and lips, bedsores form on the back, the skin may become livid, or marked with livid spots. The patient may die insensible, or gradually recover. Affections of the head, and inflammations of the chest or bowels, may occur in the course of the disease. In one form of fever there is no diarrhœa.

The treatment in the early stage consists in moderating the fever by salines, acid drinks, diaphoretics. In the second stage we have to keep up the patient's strength, and to combat the diarrhœa, or other untoward symptoms. The first is done by constantly giving strong broth, as well as wine or brandy. The

patient is totally unconscious of his own wants; they must be attended to for him, or he will die of inanition. Half-an-ounce of brandy (in water) every hour, and a teacupful of broth every two hours, will not be too much in severe cases. When stimulants make the pulse both slower and stronger, we may be sure that they do good. When the head is affected, the hair may be cut short, and an ice-bag applied to the head. The surface may occasionally be sponged with tepid water, then quickly dried. As soon as the patient is better, the pulse soft, and the skin moist, quinine may be given with great advantage, in 2-grain doses every two hours. Sleeplessness with delirium may be met by opium, when the skin is moist and not too hot. In similar cases opium may be given with chalk to check the diarrhœa. In others, chalk mixture alone, or sulphuric acid drinks. Care must be taken to empty the bladder when the patient is unconscious, and to protect the back by a plaster against a bed-sore from pressure.

In convalescence we must begin with farinaceous food, then give broths, then boiled sole, whiting, or chicken, and other meat gradually. The allowance of stimulants should be pretty liberal till the strength is quite restored.

Every cause of debility renders a man more likely to take fever. Fever spreads with immense rapidity in close, confined places, afflicted with damp, bad smells, no ventilation, impure water, and uncleanli-

ness. It is not strictly true that a bad smell will cause a fever. It may do so when a drain has been laid open into which passed the sewage of houses which were invaded by fever some time since. Or the bad miasma may so lower the constitutional powers that a person catches the disorder who would otherwise have escaped it. Then, when it breaks out, the want of ventilation causes the poison to stagnate and so become more virulent. Thus fever may prove very fatal in such a locality. Those who are ill-fed are the sooner carried off by it. Men and women crowded together in emigrant ships are exposed to all these causes which render fever more imminent, and more dangerous when caught.' It is the object of the sanitary reformer, it should be the aim of every one, to sweep away those opprobria of our modern civilization which tend to shorten the lives of the poor. There is no vaccination for fever, but we may stave off or prevent its onslaught by building better dwellings for the labouring classes, preventing them from herding together like cattle, attending religiously to the details of drainage in towns, and impressing on the poor themselves the vital importance of ventilation and cleanliness.

FLATULENCE.

An accumulation of gas in the stomach causes pain, eructations, vomiting, and palpitation of the

heart. It is an ordinary symptom of indigestion. An effervescent or Seidlitz draught, some sal volatile or ether in a glass of water, or a dose of rhubarb and magnesia, will disperse it. (See Acidity, Indigestion.) Gouty patients are often subject to flatulence.

Flatulence may occur to a distressing degree in persons debilitated by serious disorders, as fevers, dropsy, disease of the heart. It is then to be combated by stimulants, ginger, peppermint, &c., or opium. Another form is frequent in hysterical women. (See Hysteria.)

Gall-Stones.

These are small concretions formed by inspissation of the bile in the gall-bladder. The passing of a gall-stone along the duct causes paroxysms of excruciating pain in the pit of the stomach, with vomiting. If the duct remain obstructed, jaundice occurs, from retention of bile. The pain caused by gall-stones, like that of colic, is relieved by pressure, and thus distinguished from inflammation. Some carbonate of soda (1 dr.) may be taken in warm water, to favour the vomiting and relieve the pain, or opium given.

Gastrodynia. *Pain in Stomach.*—See Acidity.

If very severe, there may be inflammation, which is dangerous, but rare.

GONORRHŒA. *Gleet.*

It is not within the scope of this work to treat of this and other such disorders. For the ordinary treatment, see Copaiba, in Index of Remedies.

GOUT.

A painful affection of the joints, arising from a poison generated in the blood. In many points it resembles rheumatism. But gout attacks first the small joints, as of the toes and fingers. Rheumatism fixes on the large joints first. Gout attacks the indolent, the rich, the well-fed, in most cases. Rheumatism is commonest in persons much exposed, the poor, the ill-fed. Gout is rare in the young. Rheumatism attacks children often, and is most fatal to them. Gout depends on the presence in the blood of uric acid, the same which forms red deposits and gravel in the urine. Rheumatism is supposed to depend upon lactic acid, the acid of sour milk. In both, then, there is a predominance of acid in the system.

A fit of gout is preceded by symptoms of indigestion, and some feverishness, perhaps headache. It comes on in the night; acute and grinding pain of the joint of the great toe, going off towards morning, leaving the part red, tender, swollen, and shining. There is an acid perspiration during this subsidence. For several nights the inflammation may recur; then disappear, and come on again in about a year's time. Chronic gout may cause disorder of the stomach,

heart, or kidney. It may attack the fingers, causing the excretion of earthy matter, "chalk stones" (urate of soda).

The remedy for the fit is colchicum, and blue pill. Foment the part. In the intervals, alkalis, magnesia, lime, cathartics, occasionally. Gout is commonest in those who can afford the best medical advice.

GRAVEL.—See Calculus.

HÆMOPTYSIS. *Spitting of Blood.*

This may be caused by various diseases of the chest, and other organs. The blood is coughed up. When vomited, it must come from the stomach. Hæmoptysis to a slight extent occurs in pneumonia. Copious spitting of blood may happen in a rare kind of bronchitis. It may be caused too by cancer or gangrene of the lung, or disease of the heart. (See Rheumatism.) But most commonly it is a symptom of consumption. When slight it relieves the lungs. When copious it may be met by a saline regimen, low diet, and astringent medicines, as dilute sulphuric acid, acetate of lead, catechu, &c.

HÆMORRHAGE. *Bleeding.*

Bleeding from arteries or veins may result from a wound. Compression must be firmly applied just above the injury, and a pledget of lint and bandage to the wound. Hæmorrhage from mucous

membranes may occur from injury, inflammation, or congestion (from disease of heart, &c. See Dropsy.) Bleeding from the bowels occurs in dysentery; from the lungs in consumption; from the stomach in ulcer or cancer of the organ; from the nose in fulness of the head (see Epistaxis); from the kidney in gravel, inflammation of the kidney, Bright's disease, &c.; from the womb in menstruation, abortion, labour, &c. Bleeding internally is treated by astringent medicines, and a low diet, with saline purges.

HÆMORRHOIDS. *Piles.*

Swellings consisting partly of enlarged veins, partly of mucous membrane, situated at the end of the lower bowel, either inside or just outside the verge. There may be much heat and pain; and occasionally they bleed. They may be caused by indolent habits of life, and want of walking exercise. Constipation of the bowel in persons past middle life will cause them, if suffered to continue. Or they may be due to an opposite cause, the excessive use of irritating purgatives. Piles are frequent in pregnant women.

It is best to keep the bowels always gently relaxed, which may be done by using castor-oil habitually (twice a-week). To allay irritation and pain some cold cream may be applied, or warm fomentations used. Touching freely and repeatedly with

nitrate of silver will often cure piles. But when they have reached a certain point, the operation of excision may become necessary.

HEADACHE.

Throbbing or acute pain in the forehead or other part of the head occurs from congestion, anæmia, inflammation, or irritation from some remote disease. A very severe form occurs in inflammation of the brain (which see). Headache in sickly children may arise from an opposite cause (anæmia), and require stimulants and support. Indigestion or bilious disorder is the commonest cause of headache, and demands purgatives, sometimes alkalis. Nervous and hysterical females are subject to headache. Give ammonia, valerian, ether. When headache recurs at fixed times of the day, or over one brow, give quinine.

HEART, DISEASES OF.

To distinguish the diseases of this organ demands a high degree of medical skill, an accurate knowledge of the anatomy of the organ, a correct ear to judge of the indications of the stethoscope, and much practice.

The point or apex of the heart moves as it beats. The apex is behind the ribs on the left side at a point two inches below the nipple in men, and one inch to its inner side. On listening opposite the

apex the sounds of the heart are best heard. In disease they are different from the sounds in health, a blowing or gushing being frequently substituted for the simple thump of the first sound of the heart. This indicates disease of the valves, which tends to shorten life. It is caused by inflammation of the heart, which occurs generally in the course of rheumatism (which see), more rarely of gout. Valvular disease is also caused by osseous deposits and alteration of the tissue of the valves of the heart. This may happen after middle life. Irregularity of the pulse, a tendency to palpitation and fainting, are symptoms of heart disease. But palpitation and fainting may be produced by other causes, as simple indigestion, &c. Spasm of the heart (angina) is a temporary stoppage of the organ, with great pain and anxiety. A cordial should be given immediately. Diseases of the heart often require a supporting treatment. They may cause death suddenly, or slowly, with dropsy (which see.)

Hoarseness. See Aphonia, Dysphonia.

Hooping-Cough.

A contagious epidemic cough, happening generally in young children, and only once in life. At first a slight cough and cold; after some days the cough comes in severe fits, after which the breath is drawn in with a long effort, and a peculiar sound, or whoop. It may last ten days or

a fortnight, or much longer. Suffocation may be threatened, and vomiting accompanies the attacks, when severe. It is rarely fatal. The chest may be rubbed frequently with opodeldoc, or camphor or turpentine liniment. An ipecacuanha and saline mixture should be given, and castor-oil occasionally. The danger of infection lasts for a month or six weeks after recovery.

HYDROPHOBIA.

It comes on some weeks, or many months, after a bite from a mad dog or other rabid animal (when the bite has not been cauterized, or the part cut out). It may commence with inflammation at the seat of the wound. A nervous and restless condition is aggravated until the state of excitement is extreme, and sleep impossible. There are convulsions, delirium, spitting and foaming at the mouth, with a *horror of water*. In two or three days the patient dies, generally from exhaustion. No one has ever recovered from this terrible disease. Opium may be given to mitigate the agony of the patient.

HYDROCEPHALUS. *Water on the Brain.*

It occurs in young children of a scrofulous constitution. It consists in the formation of tubercles on the surface of the brain, subsequent inflammation, and the production of a serous effusion between the brain and the soft skull. Often preceded by feverishness

and loss of health for some time, it may happen with no such warning. It comes on with fever, and severe pain, causing the child to scream, and put his hand to his head. The face is flushed, there is no sleep, the eyes squint, there is delirium, often convulsions, or vomiting. The head swells. Later, the pupils of the eyes are dilated, profound stupor ensues, the pulse becomes slow, the child dies insensible. Leeches may be applied to the head, a blister to the nape of the neck; strong cathartics used, especially calomel. Chronic cases are slower, and less marked. All generally end fatally.

Hysteria.

This is the term applied to a deranged state of the nervous system and whole constitution of females, especially those in easy circumstances, and of torpid habits. It is rare in children and old women, occurring in intermediate ages. Hysteria shows itself (1) by attacks of convulsions of a peculiar kind; (2), by a long train of nervous disorders, also peculiar. The fit of hysteria is very different from that of epilepsy. There is not insensibility; the patient, if she falls, does not fall heedlessly, but in some comfortable place.!!! There are convulsions which seem partly under the control of the will, with alternate crying and laughing. No doubt these symptoms are to a great extent involuntary, but they may sometimes be controlled by a strong effort of

the will. The hysteric fit is preceded by a feeling as of a ball rising in the throat. After it there is generally a copious discharge of limpid urine. The best way of dealing with it is to pour water in a small stream over the face and neck till recovery takes place; but this may prove too rough for the taste of some delicate females.

Among the hysterical disorders are flatulency, vomiting, palpitation, difficulty of breathing, choking sensations, loss of voice. Hysterical pain, hysterical paralysis, and hysterical affection of the joints, are the most peculiar. These symptoms sometimes deceive even the skilful practitioner. But all hysterical symptoms are known by their occurrence in young females, and by the absence of any serious disease to account for them. These disorders, as far as sensation goes, may be real enough; but their reality goes no further: they exist in the mind of the patient, and not in the part supposed to be diseased. Thus terrible pain is complained of. The skin is touched and the patient screams, but, on continuing to press firmly, there is no renewal of the pain, thus no inflammation. The same occurs with a joint, which the patient will not suffer to be moved or handled. The face meanwhile is not worn, and expresses no suffering. There may be paralysis of a limb, to all appearance; but it is certain that it will move briskly enough, if we can restore the patient's health.

Good food, good air, will generally remedy this state of health. It is rarer in the married than the single. The bowels and the menstrual function should be attended to, active exercise and cold bathing enjoined.

INFLAMMATION.

Inflammation is an excess of vital action at any part of the body. It may be confined to one spot, or extensive. Inflammation of any of the internal organs is dangerous. It produces heat, swelling, and redness from an engorgement with blood, with pain, increased by pressure. If extensive, the whole system sympathises with the local mischief, and there is fever, quick pulse, dry skin, coated tongue, loss of appetite, diminished secretions, the urine being high coloured; at the same time the blood is altered. There is more fibrine or coagulable material in it. The blood, if drawn, instead of the healthy coagulum, forms a firm clot with a whitish upper layer.

Unless cut short in the first stage, inflammation goes on till an effusion of liquid matters from the blood takes place in the interstices of the inflamed part. Lymph and serum are poured out. Either the lymph coagulates and hardens, and the serum is absorbed, the lymph itself being also slowly absorbed in most cases; or another change takes place, called suppuration. The lymph and serum degene-

rate into a thick yellow fluid called pus (matter), which cannot be absorbed. There is then an abscess. Throbbing takes places during its formation, and the matter endeavours to work its way out to the surface. The process is assisted by poulticing, or lancing when the abscess is ripe. In the first stage of inflammation applications of lint dipped in cold water and covered with oiled silk are the best.

Inflammation may also lead to mortification and sloughing, or, if on the surface, may cause an ulcer, or open sore.

INFLUENZA.

This is a severe epidemic catarrh. It spreads rapidly over large districts or towns, being commonest in wet and cold seasons. The usual symptoms of cold in the head and chest are present in each case, but there is a remarkable tendency to prostration both of body and mind. There may be a low fever, lasting for days or even weeks. Pains in the limbs and trunk accompany the other symptoms. Influenza may carry off old and feeble persons by producing inflammation of the lungs or other internal organs. A warm bath should be given at the outset, and perspiration promoted. Afterwards the patient should be supported by a nourishing diet and stimulants, as wine, brandy, and ammonia. Old persons in particular will require a generous treatment in this disorder.

ITCH.—See Skin Diseases.

JAUNDICE.

The skin in this disease is yellow, the whites of the eyes have the same tint, the bowels are confined, the evacuations white or clay-coloured, the urine deep yellow. Bile is present in the blood; it is not excreted by the liver into the bowels as it should be; it is partly secreted by the kidneys. Permanent jaundice ends in wasting and death, but this is rare. Temporary jaundice is caused by inflammation of the liver, most frequent in spirit-drinkers, or by obstruction of the biliary ducts by gallstones; or from indigestion, some blood disease or fever, or nervous shocks. Calomel, purges, and alkalis, cure ordinary cases.

JOINTS, INFLAMMATIONS OF.—See Rheumatism, Gout, Scrofula.

KIDNEYS, INFLAMMATION OF.

It may occur from injury, from gravel, from cold; from gout, rheumatism, or scarlatina. There is great pain and tenderness in one or both loins, extending to the front, shivering, fever, vomiting. The urine is scanty, high-coloured, may be dark from the presence of blood, or may contain albumen. If acute inflammation continues, or the urine be retained, death results after two or three days, with delirium and insensibility preceding it. It may seem to

recover, but continue in a chronic form. After some days, weeks, or months, dropsy comes on, with diarrhœa, sickness, and catarrh. (See Bright's disease.) Tartar emetic should be given frequently at the onset, or calomel with opium.

Larynx, Inflammation of.—See Throat (inflammation of), Aphonia, Dysphonia.

Inflammation of the larynx, often producing ulceration, occurs in the various forms of sorethroat, brought on by cold, exertion of the voice, consumption, or syphilis. Acute inflammation of a dangerous kind may happen in severe eruptive fevers or erysipelas, or even from a cold. There is great pain and fever, tightness of the throat, loss of voice; respiration and swallowing are difficult; there are convulsions, delirium; the pulse fails, the face becomes livid, and the patient dies insensible. Tartar emetic may check it, if given repeatedly at the onset. In milder cases, apply a blister, and give calomel and opium.

Leucorrhœa. *Whites.*

A white or yellow discharge, occurring in delicate females of all ages; distinguished from gonorrhœa by the absence of burning. It is often accompanied, or brought on, by indigestion, constipation, hysteria. There may be pain in the left side. The general health should be improved by tonics and change of

air, with cold bathing. Keep the bowels regular by castor-oil. If necessary, inject an astringent solution of alum, sulphate of zinc, catechu, or tannic acid. An injection of a solution of nitrate of silver will often arrest it.

LIVER, INFLAMMATION OF.

It may be caused by biliary calculi, injury, or dysentery of the bowels. But the commonest cause is the abuse of alcoholic liquors. There is pain and tenderness opposite the lower ribs on the right side, constipation, perhaps vomiting, more or less jaundice, some fever, cough, and pain in the right shoulder. It goes off in some days with diarrhœa and perspirations; or it may lead to abscess, with chronic jaundice. In spirit-drinkers, repeated attacks cause an effusion of lymph in the substance of the liver; the organ shrinks, and the surface has a hobnailed appearance (when seen). Tartar emetic and a saline aperient may cut short the acute attack. The hobnailed liver causes, sooner or later, dropsy of the belly. (See Dropsy.)

LUMBAGO.

Excruciating pain and tenderness of the muscles of the loins, aggravated by motion, often preventing a patient from walking, and confining him to a recumbent posture. In many cases it arises from exposure to cold, being a local form of rheuma-

tism. It then requires alkalis, sudorifics, opium, and warm fomentations to the loins. Sometimes it is neuralgic, and connected with loaded bowels. A dose of aloes and blue-pill, or of turpentine and castor-oil, may then remove it. A liniment of opium may be applied in severe cases.

LUNG, INFLAMMATION OF.—See Pneumonia.

MEASLES.

This is a contagious eruptive fever, which usually happens early in life, and seldom more than once in the same person. The time between exposure to infection and the commencement of the symptoms is called the period of incubation. In measles it is from ten to fourteen days. After that time comes a feverish state, accompanied with symptoms of catarrh. There is coryza, with redness and watering of the eyes, and sharp cough. Vomiting is frequent. This fever lasts four days. Then the eruption begins. Red points, first on the face, then over the body, forming at length clusters of a crescent shape. The cough continues and becomes loose. After three or four days from its commencement the rash begins to fade, and the fever declines. The rash fades first on the face, then on the limbs. In about two days it disappears with scurfing of the skin.

In some severe cases of measles there is inflammation of the lungs, or the rash is livid in hue and

the symptoms are like those of typhus fever. The cough frequently continues after the rash is gone, and the disorder will often leave behind it some delicacy of the chest.

In ordinary cases rest, abstinence, mild saline diaphoretics, with ipecacuanha, and attention to the bowels (castor oil) form the treatment. If the cough continues when the rash is gone it must be treated like ordinary bronchitis.

MUMPS.

This is an infectious disorder, which manifests itself by causing swelling of the salivary glands in the neck. The glands below the ears and under the jaw are both affected. Generally it attacks both sides, but it may be on one side only. It causes much difficulty in eating and swallowing, and may be attended with considerable fever, loss of appetite, &c. It lasts for four or five days, and then declines. The face should be wrapped with a flannel bandage, so as to protect the glands from cold. A low diet, confinement, and a saline purge, or castor-oil, may be all the treatment required. Like other infectious diseases, it is most frequent in children.

NEURALGIA. *Nervous Pain. Tic.*

Severe pain occurring in any part of the body, relieved by friction or pressure, and thus distinguished from inflammation. It occurs frequently

in the surface of the face (*tic-douloureux*), in the teeth, the head, the left side in women. In the forehead, on one side, it is called *brow ague*. Warm fomentations, poultices, mustard or ginger plaster, bags of hot salt, relieve it sometimes. Poppy or opium liniments may be used. Purgatives may be given internally; or, for very severe pain, opium or Dover's powder. When recurring at tolerably regular intervals (periodic), quinine will cure it. (See Ague.)

NERVOUSNESS.

There is an irritable state of the nervous system, commonest in women, but occurring also in men. When aggravated, it constitutes Hysteria. Causeless irritability, flushings from slight emotion, tremblings, sudden attacks of faintness or palpitation, a variable and excitable temper, fits of low spirits, a tendency to weeping from slight cause, are symptoms of this common affection. It requires attention to the general health, stimulants (ammonia, wine, valerian), tonics, or iron. Excessive study, anxiety, exhausting diseases, may cause it in those who were previously robust.

OPHTHALMIA. *Inflammation of the Eyes.*

It begins on the mucous membrane, or surface of the eye (conjunctiva), and may not extend beyond it. Simple cases result from cold. There is pain, red-

ness, feeling as of sand beneath the lids, weakness of the eye, with a flow of tears. Bathing with hot water, or lead lotion, cures it.

Ulcers may form on the eye in scrofulous children, which leave white spots on the cornea.

Purulent ophthalmia may occur in adults or children. It is caused by excessive irritation, but most commonly by the infectious gonorrhœal discharge. The inflammation is very severe, the cornea may ulcerate, the iris protrude, and the eye be destroyed. The same may occur in small-pox. A lotion should be used containing alum (10 gr. in 1 oz.), or nitrate of silver (1 gr.). The disease is communicable by means of the matter secreted on the eye.

Inflammation of the iris, the coloured zone in the eye which surrounds the pupil, is not uncommon in secondary syphilis, and may be caused by gout and rheumatism. A red circle of injected vessels appears in the white of the eye round the cornea. There may be fever; there is deep-seated pain in the globe, worse at night. Lymph is effused on the surface and edges of the iris, which becomes changed in form, and may remain permanently contracted, obstructing vision. To prevent this result, 2 gr. of calomel with $\frac{1}{4}$ gr. of opium should be given every three hours till the symptoms abate.

Paleness.—See Anæmia.

Palpitation of Heart.

A sudden quickening of the action of the heart, the beats being violent, irregular, and a sensation of faintness experienced. It occurs in disease of the heart, in which case there has probably been some time before an attack of rheumatic fever accompanied with serious heart derangement. But in forty-nine out of fifty cases, palpitation is connected with no serious disorder whatever. Its common cause is indigestion, with flatulence. It may also be caused by hysteria, by any sudden excitement, or by pregnancy. To relieve it, give a teaspoonful of sal volatile in a glass of water, or some ether in a little wine. Attend to the state of the digestion.

Paralysis. *Palsy.*

A stroke of apoplexy is followed by loss of the power of motion in the arm and leg on one side. Sensation is lost more rarely. The muscles of the face, tongue, and throat are affected in serious cases. The face is drawn to the sound side, the tongue cannot be protruded straight.

Another kind of palsy, caused generally by an injury or disease of the spinal cord, involves both legs, or all the lower part of the body, the bowels and bladder acting involuntarily. Palsy coming on gradually is rarely cured, except that kind observed in hysterical girls, which does not last. When resulting from a stroke, rest and attention to health

may restore the lost power. Frictions of the limb, a mercurial course in robust, a sustaining regimen for weak, persons may be advised.

Pericarditis.—See Rheumatism, and Heart Disease.

Periostitis.—See Syphilis.

Peritonitis.—See Bowels, Inflammation of.

Phrenitis.—See Brain, Inflammation of.

Phthisis.—See Consumption.

Piles.—See Hæmorrhoids.

Pleurisy.

Inflammation of the Lung is called Pneumonia. Pleurisy does not affect the lung itself, but attacks the fibrous membrane which lines the chest. This membrane, the pleura, is in two layers; one covers the lung, the other adheres to the ribs. A glairy moisture is between the two. Inflammation of this membrane may be caused by cold, by injury, by rheumatism, &c. When there is any inflammation of the lung (pneumonia or consumption), inflammation of the pleura takes place opposite the spot. Pleurisy causes sharp pain in the side, short, dry cough, quick breathing, fever. The cavity of the pleura is dry at first, and the inflamed surfaces rub against each other. But soon an effusion takes place into the cavity. It may be very copious, swell out the chest, and take weeks to

become absorbed again, or even remain unabsorbed. The patient lies on that side, and breathes with the other. Most cases of pleurisy are simple. Give calomel and opium regularly for some days. Blisters are useful in chronic cases.

PNEUMONIA. *Inflammation of Lung.*

Consumption produces a low kind of inflammation, in the upper parts, generally, of both lungs. Ordinary pneumonia may be caused by cold, by fevers, rheumatism, erysipelas, and other blood poisons. It is a more fatal disease than pleurisy, and particularly dangerous to the old and feeble. Pain in the chest, rapid breathing, fever, constant cough, with scanty expectoration tinged with blood, usher it in. It generally affects one lung only, and that at the base. On listening at the chest at one side below, a fine crackling sound is heard. The air-cells contain serum and lymph. One marked symptom of pneumonia is a peculiar heat and dryness of the skin. At the second stage, after one or two days, the rusty expectoration ceases. The affected part is dull on percussion. The air-cells are rendered solid by coagulated lymph. The patient may die at this stage, or go on to the third (two or three days more). The air-cells become pervious again, a loose expectoration appears, the lymph is absorbed, and the patient recovers. Or, in bad attacks, the lung mortifies instead, and he dies.

There are three methods of treatment, according to circumstances. For simple cases, give nitric ether and a saline every two hours, low diet, castor oil. With high fever, in robust patients, tartar emetic mixture every two hours, in doses not large enough to produce vomiting. When there is exhaustion, with pulse rapid and small, and face dusky, *give brandy freely.*

PORRIGO.—See ringworm, and skin diseases.

QUINSY. *Inflammation of the Tonsils.*

A mild inflammation of the tonsils occurs in ordinary sorethroat (which see). Sloughing may occur in the sorethroat of scarlatina or diptherite. An attack of acute inflammation is called quinsy. There is considerable fever, pain in the throat, thickened voice, feeling of suffocation, great swelling, and in the end often suppuration of the tonsils (the glands on each side of the opening of the throat). It may be caused by cold, scrofula, &c. At the outset a solution of nitrate of silver, or tincture of iodine, may be applied to the tonsils, and an emetic given. At a later stage give saline purges, nitric ether, and poultice the throat externally.

RHEUMATISM.

For the differences between gout and rheumatism, see Gout. Acute rheumatism is called rheu-

matic fever. It is commonest in children and young persons. It commences with fever, a full quick pulse, hot skin, tongue thickly coated, loaded urine. Then pain comes on in one of the larger joints, which increases in severity, until the joint is highly inflamed, red and swollen, and so excessively tender that it cannot be moved or touched. There are now occasionally profuse sour perspirations. The inflammation may begin in the knee, ankle, elbow, wrist—more rarely the hip or shoulder. It changes continually from one joint to another. Sometimes the muscles are affected, those between the ribs being especially liable. In the latter case the act of breathing becomes painful. But this symptom may proceed from a more serious cause. The heart, in children especially, is apt to be invaded by rheumatism. Inflammation of the heart is known by pain in the left side, palpitation, and an irregular pulse, a feeling of distress and tightness of the chest, with difficult breathing. These symptoms should be inquired for, and especially noticed. The pericardium, or membranous covering of the heart, may be attacked. Fluid collects in it, and the sounds of the heart are dulled. After a time the fluid disappears, and no particular harm results. But often the inner fibrous lining (endocardium) is attacked. This is highly dangerous. For out of this fibrous membrane are formed the delicate valves which guard the portals of the four cham-

bers of the heart, and are concerned in regulating the influx and efflux of the blood through the central organ of the circulation. When it is inflamed, unless the inflammation is quickly cut short, its result is to form deposits of lymph on these valves. On recovery they are permanently enlarged, or sometimes contracted. There is then either an impediment to the passage of the blood forwards, or a passage backwards is allowed, according as the affected valve is in front of the ventricle, or behind it. Months after the attack of rheumatism, on listening opposite the heart (at a point two inches below, and one inch to the inner side, of the left nipple) the physician hears, instead of the natural steady double sound, a blowing or bellows-like sound which has taken the place of the first or second sound of the heart. From this state of things dropsy and death must sooner or later result.

Acute rheumatism is sometimes traced to cold, or suppressed perspiration. Often it has no such cause. In ordinary cases keep the patient at rest during the one to three weeks that the disorder will last, wrap the affected joint in cotton-wool, applying an alkaline lotion of carbonate of potash. Give Dover's powder at night (but not to young children). Administer lemon-juice,—with diaphoretics, nitric ether and a saline, every three hours—and an occasional dose of castor-oil. When the heart is attacked apply at once a blister three inches in diameter,

opposite the point just indicated as the apex; and give tartar-emetic (a quarter of a grain), and tincture of opium (five drops) every three hours, to a grown person. To children give mercury and chalk instead. Low diet is necessary throughout the attack; but, in convalescence, where there is much debility, a generous regimen may be ordered.

Chronic rheumatism is frequent in old people, especially of the poorer classes. There are pains in the larger joints, and sometimes in the fingers, with swelled knuckles. There are also pains in the muscles and limbs, and wandering about the body. Lumbago and sciatica are local forms of the affection. In chronic rheumatism there may be no fever or sweating, even no obvious inflammation. The first part of the cure consists in removal of the causes, by a continuance of which it is kept up. Rooms with stone floor and walls; insufficient clothing, especially want of flannel; a fire-place too small, or ill supplied with fuel in winter; want of food, especially meat; these are among the most obvious. Another, often overlooked, consists in want of ventilation (excused by insufficient clothing). The old man (or woman), incapable of brisk locomotion, and after only half a breakfast, totters, thinly clad, out of a warm close room into the cold air without; and the repressed action of the skin brings on a fresh attack of those "rheumatics" of which he is always complaining. Those who remove these

causes of disease, by their charity and good advice, go more than half way towards a cure. For medical treatment, warm clothing, generous living, Dover's powder at night occasionally, and a mixture of nitric ether and acetate of ammonia, may be recommended.

RICKETS.

This is a softening and giving way of the bones, which occurs most frequently in delicate and scrofulous children. The health is deranged generally, the bones of the legs bend outwards, the head may become enlarged, the belly protuberant. Keep the child from walking till the legs are able to bear its weight; give codliver-oil and asses' milk; let it have good air and sea-bathing. Lime-water with three parts of milk is a good medicine.

A similar softening of the bones may take place in old people. It is frequently incurable, but may be combated by a generous diet and mineral acid mixture.

RINGWORM.

A contagious form of porrigo (see skin-diseases), commonly attacking the face or head of children. There are circles of small pimples or scurf, sometimes irregular patches, which destroy the hair and tend to spread. At the outset either nitrate of silver or tincture of iodine may be freely applied

to and beyond the bald spot. This may cut it short. Later dilute sulphuric acid may be applied, till it produce slight burning; or a lotion used, of acetate of lead and vinegar. The general health must be attended to. Other children must be kept away from the infected patient, and separate towels and washing-basins used.

SCARLATINA.

A contagious eruptive fever, which generally occurs early in life. It seldom happens twice in the same person, but is more likely to do so than measles or small-pox.

The period of incubation varies, generally from seven to ten days; but cases have come on after a few hours from exposure to infection. For twenty-four hours there is fever, with nausea, pains about the body, sleeplessness. On the second day comes the rash, spreading from the face and neck over the breast, trunk, and limbs. First there are a multitude of minute red points. Then these run together, so that the whole surface is scarlet. The skin itches, the tongue presents prominent red points, with fur between. The tonsils are enlarged, the throat red and sore, and swallowing painful. Sore-throat is the main characteristic of scarlatina, as cough is of measles. The rash generally goes on till the fifth day, when it begins to decline. The fever keeps pace with it. If severe, the patient is very restless,

there may be delirium, and the pulse, from being rapid, become intermittent. There is then great danger. Otherwise the rash fades away, and disappears about the eighth day, with scaling off of the cuticle. During the disorder the bowels are confined, the urine is scanty and high-coloured. The child should be kept quiet and warm for three weeks or so after the subsidence of the rash; otherwise dropsy of the surface of the body may come on.

A mild, saline treatment, with aperients, suffices in most cases. Perspiration should be encouraged, and the skin may occasionally be sponged quickly with warm water, being immediately afterwards rubbed dry with a warm towel. Acid drinks (see acetic acid) are beneficial. During convalescence broths may be gradually replaced by more solid food, and quinine or iron given to restore strength. The room should be ventilated, but no draughts permitted, the temperature being kept between 60° and 70°. When the throat is much inflamed or ulcerated, a poultice may be applied externally, or a solution of nitrate of silver brushed over the tonsils.

Scarlatina is a dangerous disorder, on account of its liability to appear in aggravated forms. In one variety of the disease the tonsils inflame and suppurate, and the glands in the neck may do so also. In another form the succession of symptoms is irregular, the face is dusky, the rash livid in colour, and the fever like that of typhus. The danger is extreme,

and the patient requires stimulants most urgently. In a third form the fever and sore-throat may appear without the rash. It is often fatal, and may be mistaken for diphtheria (which see).

SCIATICA.

Acute, often agonizing pain, in the course of the sciatic nerve, *i.e.*, along the back of the thigh, from the hip to the knee. It may be caused by cold, as by sitting on a wet seat in driving. It may be a symptom of rheumatism. Or it may arise from the pressure of loaded bowels on the nerves in the pelvis.

The local treatment consists in rest, wearing warm flannel drawers, hot fomentations, or applying a blister over the most painful part. Brisk purges may be given to relieve the bowels, as aloes and blue-pill. Doses of turpentine with castor-oil often do great good. In rheumatic cases, alkalies and sudorifics are to be recommended.

SCROFULA.

A depraved habit of body, often indicated by a thick upper lip and long eyelashes. The child may have crooked limbs, a swollen belly, and be weak in intellect. If it grow up it is pale, ill-nourished, with a tendency to eruptions, to a swelling of the glands in the neck, to enlargement and inflammation of the joints. Scrofula is often

hereditary; it is caused by the parents being ill-fed, ill-lodged, and unhealthy; drunkards, or with a syphilitic taint. Ill-advised matches between near relations, very young or sickly persons, engender scrofulous children.

Good food, good air, and exercise, may eradicate the taint. Cod-liver oil, iodine, and the preparations of iron, may be given as medicine.

SCURVY. *Scorbutus.*

This consists in a degenerated state of blood, which most commonly occurs in sailors, when restricted to salt meat and dry biscuit for food. It may happen in landsmen from similar causes. The skin becomes covered with spots, from blood extravasated beneath it. The gums are swollen and spongy, bleeding with a touch. There are hæmorrhages from various internal parts. The joints become painful, and swell, ulcers may form on the legs, the breath is offensive, the pulse feeble and quick, the bowels are relaxed, there is excessive debility and lowness of spirits. The error of diet should be cured as soon as possible. Lemon-juice, citric acid,—if possible, fresh vegetables—should be given. In aggravated cases give bark and stimulants.

SEA-SICKNESS.

A distressing form of nausea and sickness, which makes even a short sea-voyage a period of in-

tolerable misery to some persons. There are many ways of treating it. Cold brandy and water benefits some persons, but makes others worse. Two drops of creosote on a lump of sugar may stave it off, but is a nasty remedy. Five drops of chloroform dissolved in half a glass of sherry, and cold water added, to half a tumbler-full, is the most effective remedy with which I am acquainted. On commencing a voyage of some length it is a good way to empty out the stomach, and remove acidity, with an emetic of a teaspoonful of soda in a tumbler of warm water. Afterwards drink soda-water.

SKIN DISEASES.

Eruptions on the skin are caused rarely by external irritation, most frequently by some disorder of the blood, which takes this manner of discharging itself. There are several kinds of eruptions, called rashes, vesicles, pustules, scales, and tubercles.

Rashes (Exanthemata).—These are superficial red patches, becoming pale on pressure. Measles, scarlatina, and erysipelas, exhibit peculiar rashes. Simple redness of the skin of various parts (erythema) is produced in many persons by indigestion. Nettle-rash (urticaria), consisting of raised spots, white with a red margin, which itch very much, is caused by unwholesome food. It is cured soon by gentle purges and salines. Rose-rash,

circular patches of a pink colour, occurs in infants during teething.

Vesicular eruptions.—These consist of a number of small elevations, round or pointed, containing lymph, and leaving a scurf or thin crust after breaking. Chicken-pock is characterized by an eruption of this kind. Eczema, or scald, consists of a number of small vesicles on a surface of red skin. It may last some weeks. It smarts rather than itches. Sometimes it becomes chronic. It should be treated with water-dressing, dusted with flour, or soothed with a simple ointment. Aperients and salines should be given. Herpes, or tetter, consists of larger and more distinct vesicles. It often affects the lips, and is accompanied with coryza. One severe form, attended with fever, surrounds the body like a girdle. It is called "shingles." It lasts two or three weeks. Treatment as before. Scabies, the itch, is the most serious kind of vesicular disease. The vesicles are mostly between the fingers, or on the arms, inside. The itching is intolerable. This disease is communicated by contagion. Sulphur ointment should be applied to the part at night, the hands then enclosed in bags of oiled silk, and in the morning washed with soap and hot water. Sulphur and alkalies should be given internally.

Pustular eruptions.—Here the elevations are more inflamed, and contain pus; after breaking, a thick crust is left. Smallpox is the severest form of

pustular eruption. The simplest and most harmless kind is acne, consisting of small scattered pustules on the face. It is caused by indigestion. Impetigo, crusted tetter, consists of extensive clusters of pustules, generally on the cheeks, but it may attack any part. The part is red, inflamed, and itches much; extensive crusts form, and there is some fever during the breaking out. It is commonest in infants and young children (called "milk crust"); but the severest forms occur in old persons of uncleanly habits. An alkaline lotion (carb. soda or potash) should be applied to relieve the itching. Various stimulating ointments are used. Applications of simple hot water occasionally, with attention to the health, cod-liver oil, or iron, will cure it in children after a time.

Porrigo, a disease resembling ringworm (which is separately described), attacks the scalp most frequently. It is contagious, consists of pustules involving the roots of the hair, tending to produce baldness, and leaving thick yellow scabs. The part should be shaved. Sulphur ointment may be applied, or iodine, or nitrate of silver, or dilute sulphuric acid, or strong acetic acid. Porrigo is ascribed to a parasitic fungus, which is destroyed by these chemicals.

Pimples, or papular eruptions.—The elevations are small, round, and hard, accompanied by itching. They are often chronic, lasting a long time. Lichen,

called tooth-rash or red-gum, attacks children at the breast, or during teething. It disappears when the health is attended to. Lichen also attacks adults, and requires alkalies externally and internally, with alterative treatment. Prurigo is an eruption of pimples with a black head, accompanied with intense itching. It only becomes troublesome when in old persons. Sulphur ointment, alkaline washes, ointment made of lard and tar, may be applied. Iodide of potassium, or the mixed acids (see Nitric Acid), may be prescribed.

Scaly eruptions.—These are not common. They are called lepra (leprosy) and psoriasis (dry tetter.) They consist of red elevations with white scales of half-detached cuticle, and generally appear on the knees, elbows, or backs of the hands. The tar ointment just mentioned is the best cure; or the ointment of sulphur, or of iodide of potassium, may be used. Arsenic is given by physicians to cure these and other chronic skin diseases. Blue pill in repeated small doses often does good.

Tubercles.—These are not so much eruptions as deep affections of the skin, with a tendency to wide-spread ulceration. Several forms are met with in tropical climates.

The disease of the face called lupus commences with a tubercle, which sloughs, and forms an open ulcer. At this stage its progress may be cut short by cauterizing with nitric acid, or nitrate of silver,

or caustic potash. It may heal, and leave only a scar; but if suffered to continue long it spreads widely, and eats into the face, destroying the flesh to the bones, and carrying all before it, making a hideous spectacle of the wretched patient, whose pain and sufferings are at length ended by death. It resembles cancer in its progress, but does not appear at distant parts. These are the chief varieties of skin disease.

Many eruptions like the above, especially roseola, lichen, psoriasis, and tubercle, may be produced by the poison of syphilis in adults, or in children whose parents are infected. The syphilitic eruptions are known by the history of the patient and his other maladies, also by two peculiar signs: they do not itch, and they present a coppery or livid hue. When occurring with the early symptoms, mercury must be given; when with the later, iodide of potassium. Mercurial ointment or mercurial washes may be used to the skin. To an infant grey powder may be given, or cod-liver oil with iodide of iron.

SMALLPOX.

A severe contagious eruptive fever, generally occurring only once in a life. The period of incubation lasts about twelve days. Then comes fever, lassitude, headache, pain in the back and loins. The pulse is very quick, the skin hot. This fever

lasts for two days, when an eruption of raised red spots comes out on the face and forehead. On the third and fourth days it spreads over the body. On the fifth day each pimple has become a vesicle, round, depressed in the centre, and with an inflamed margin. The fever diminishes. For the next three days these vesicles change to pustules, containing matter. They are now hemispherical, or prominent. The face swells, and the eyes are often closed. The pustules are perfect on the eighth day on the face, later on the hands and feet. About the tenth day they begin to dry up and form a crust. This, falling off, leaves the skin of a reddish brown colour. Sometimes scars or pits are left by the healing of the pustules. The colour of the natural skin soon returns.

Increase of fever, delirium, coma or extreme prostration, are untoward symptoms which may occur during the progress of the eruption, and lead to a fatal issue. At the decline of the rash, fever called "secondary" is usual. This is the simple or mild form of smallpox.

In "confluent" smallpox the rash is more marked, and the pustules run together, leaving deep scars if the patient should recover. The fever is more severe, often typhoid in its character. The skin may become livid, blood being effused under it. The patient may die delirious or comatose. This form is very fatal.

In "modified" smallpox, which may happen now and then in persons who have been vaccinated, the course of the disease is mild, and the symptoms are hardly to be distinguished from those of chicken-pock. All kinds are very contagious.

Persons affected with this disease will of course be under the guardianship of some competent physician. An emetic of antimony or ipecacuanha, followed by an aperient, may be given at the outset. A saline regimen, with saline or acidulous drinks, may be relied on during the progress of the eruption. Occasional doses of blue pill may benefit the robust. The arms and legs may occasionally be sponged with tepid water, and then quickly dried. The room should not be too dark; it should be well ventilated, but not cold. When the pulse is weak and the strength fails, wine and ammonia may be given as stimulants. During convalescence, quinine is useful. The best way to prevent pitting is to touch each pustule, before ripening, with a stick of nitrate of silver.

The prophylactic treatment of this terrible disease is more effectual than the attempt to curb it when it has taken hold of its victim. We cannot arrest its course. We cannot do more than attempt to moderate its violence. About two in three of those who take smallpox die (supposing that they have not been vaccinated). If vaccinated the chance is that they do not take it, however much exposed. If

they do the symptoms are mild, the disease seldom fatal.

A dairymaid in the West of England informed Dr. Jenner, about the beginning of this century, that persons who had become inoculated with cow-pock were not liable to smallpox. Jenner followed up the information, found it true, and after a time the plan was approved of, and even enforced by the government of this and other countries. Cowpock is a mild local disease, communicable by inoculation from the cow to a human being, or from one human being to another. It is not contagious through the air. It produces no ill effect, and yet the person who has had it is as much protected against small-pox as if he had had smallpox itself. Children should be vaccinated as soon as possible; infants of six weeks are old enough. The lymph from a vesicle on one child is inoculated by three or four lancet pricks into the outer and upper part of one arm of another. On the second day a small red spot may be seen opposite each prick. On the fifth day there are circular pearly vesicles containing a limpid fluid. On the eighth day these are fully developed, the centre of each being depressed, and an inflamed ring round it. There is then slight fever, and some swelling of the arm. On the eleventh day the vesicle bursts, leaving a scab. About the twentieth day it falls off, leaving a permanent scar or pit. If these symptoms do not occur,

vaccination must be performed again. After seven years it is thought that the protection from smallpox is less complete, but it never ceases entirely.

In 1828 there was an epidemic of smallpox at Marseilles. Of 15,000 persons unprotected by vaccination, 1,875 died. Of 15,000 who were protected, ten died. (Dr. Guy.) Even these ten may not have been properly vaccinated. All statistics show that vaccination protects the individual, and tends to diminish the amount of smallpox in the community. Under these circumstances persons who do not have their children vaccinated are either grossly ignorant, or deliberately prefer that they should die. If they should afterwards die of smallpox, their parents are virtually as guilty of their death as if they had given them arsenic.

To remove infection from garments, &c., they should be thoroughly aired, and exposed to a temperature about equal to that of boiling water.

SORETHROAT.—See Aphonia, Catarrh, Throat (Inflammation of), Scarlatina, Diphtheria.

SPRAINS.—See Contusions.

SYPHILIS.

A distressing disorder, which spreads from the part in which it commences to the whole system, and infects the blood.

Mercury, given until it slightly affects the mouth,

is the remedy for primary cases. (Chancre and bubo.)

Iodide of potassium is the remedy for secondary and tertiary affections. (Periostitis, ulceration of the throat, eruptions, &c.) Nitric acid and sarsaparilla are also frequently given.

TETANUS. *Lockjaw.*

Violent spasms of the whole system, generally originating in a wound, commencing in a firm closure of the jaws, and apt to cause death by fixing the muscles of respiration.

Mild cases get well of themselves, the cure being assisted by a cathartic dose, and stimulants. For an aggravated attack of tetanus nothing can be done.

TOOTHACHE.

This is caused by irritation or inflammation of the nervous pulp, the delicate mucous membrane in the centre of the tooth. Decay (caries) of the tooth, commencing inside, is the most frequent cause. By removing the decayed part, and relieving the pulp from pressure, it is sometimes relieved. The tooth is then stopped by the dentist so soon as irritation has subsided. Severe cases demand the extraction of the tooth.

Toothache is sometimes neuralgic; there is no inflammation, and the teeth may be left alone.

When the attacks of pain come on about the same time each day, quinine should be given.

THROAT, INFLAMMATION OF.

Sorethroat consists in redness of the upper part of the throat, some pain and hoarseness, and swelling of the tonsils and uvula. If severe, nitrate of silver or tincture of iodine should be gently applied internally, or a blister externally. Fever should be met by salines and sudorifics. Mild cases are sufficiently met by a mustard poultice, draughts of nitric ether, and an occasional aperient. Relaxed sorethroat requires tonics, and astringent gargles of alum or tannic acid. One form is produced by over-exertion of the voice. (See Dysphonia.) Ulcerated sorethroat should be treated with nitrate of silver and astringents. When occurring in consumption or syphilis, the treatment applicable to those disorders must be adopted.

Dangerous forms of sorethroat, which may turn to gangrene, occur in scarlatina and diphtherite.

ULCERS.

Ulcers, raw open sores, may result from any cause of inflammation of the surface of the body or the parts near it. Those are to be distinguished which result from any deep-seated affection, as disease of the bones. This must be attended to. Also malignant ulcers. (See cancer; and lupus,

in Skin Diseases.) Ulcers of a special kind are caused by scrofula, syphilis, and scurvy (which see). Chronic ulcers of the legs are common in old people, and frequently accompanied with varicose veins. When recent they may be touched with nitrate of silver or tincture of iodine, till healed. When of long standing healing them up may do harm. They should be strapped with plaster, and bandaged, or, if deep, dressed with an ointment of zinc, or of chalk and spermaceti.

Uterus, Inflammation of. *Inflammation of the womb.*

The possibility of this should always be borne in mind when there is any great pain in the lower part of the abdomen in the female. In such cases active purgatives may be dangerous. For the description and treatment of this affection, see works on midwifery.

Veins, Inflammation of. *Phlebitis.*

Pain in the course of a superficial vein, as in the leg, with some swelling of the part, and fever, may cause no permanent injury, and subside in a few days. Severe phlebitis, often fatal, may result from injuries, poisoned wounds, surgical operations, or in sickly persons without obvious cause. It causes deposits of matter in various parts of the body, symptoms like those of typhoid fever, weak or inter-

mittent pulse. If these symptoms are marked, the patient will sink and die. This dangerous disorder requires the attention of an experienced surgeon. The only general treatment consists in supporting strength by means of wine, brandy, beef tea, and bark.

Vomiting.

An inverted action of the stomach, preceded and accompanied by nausea, sweating, and depressed action of the heart, is the ordinary functional symptom of all disorders of the abdomen, as cough is of those of the chest. It occurs from colic, diarrhœa, indigestion from any cause, from hernia, inflammation of the bowels, cholera, disease of the liver, a fit of the gravel. In women it is caused by hysteria or pregnancy. It is a symptom of the onset of fevers and other acute disorders.

Simple vomiting from indigestion requires encouragement. The stomach should be cleared out by a draught of warm water with a small teaspoonful of carbonate of soda. Persistent tendency to vomit requires effervescent draughts (see soda, carbonate) or small doses of opium. (See also Sea-sickness.)

Worms.

The presence of these parasites in the bowels causes wasting, loss of appetite, itching of the

nose and end of the rectum, pain in the belly, &c. There are three common kinds; thread worms, which are small and numerous; round worms, like an earthworm, but white; tapeworm, white, long, large, flat, and jointed. Worms in children require brisk purging, jalap, scammony, &c., till they are removed. More salt should be added to the food. The best cure for tapeworm and other worms in adults consists in large and repeated doses of turpentine and castor oil, ($\frac{1}{2}$ oz. each) continued (in the case of tapeworm) till the head, or small end of the worm, has come away.

PART II.

ON THE RESTORATION OF HEALTH.

2. INDEX OF REMEDIES.

In this chapter will be found an alphabetical arrangement of the chief drugs which are used for the cure of disease, and referred to in the foregoing chapter. Forms for adapting them for use, and prescriptions to suit special cases, are added under each head. Those medicines only are recommended which are tolerably safe in the hands of prescribers who are acquainted with the rudiments of medical science. Poisons are mentioned only for the sake of warning, and are marked by an asterisk. The doses mentioned must be carefully attended to. They are intended for adults. With medicines given to children, the doses for children (which are, of course, much smaller) will be told.

Acids.

Sulphuric, nitric, and hydrochloric acids are pro-

duced by the mineral kingdom. Acetic, tartaric, and citric acids (the last contained in lemon-juice) are vegetable products. The vegetable acids are less powerful than the mineral acids. All acids are used, much diluted, to make cooling drinks in fevers and inflammations. The mineral acids, especially nitric, are used externally as caustics. Sulphuric acid is employed internally as an astringent and tonic. The vegetable acids are neither caustic nor astringent, but they possess a peculiar power of counteracting scurvy and similar disorders of the blood. The acids will be found severally mentioned below.

ACID, ACETIC. *Vinegar.*

Vinegar contains about 5 parts in 100 of true acetic acid. This acid is an oxy-hydro-carbon, produced by the action of oxygen on liquids containing alcohol. Acetic acid, which is $C_4\ H_3\ O_3$, and some water, are formed by this. Vinegar is used externally in cooling lotions, and to form acid drinks in eruptive and other fevers. For a lotion, 1 oz. may be mixed with 4 of water.

(1.) Vinegar, 2 dr.*
Honey, 6 dr.
Water, 11 oz.

To make a gargle, for sore-throat, &c.

* A drachm is the eighth part of an ounce. With liquids, a teaspoonful is about a drachm, a tablespoonful being 4 dr., or ½ oz.

(2.) Vinegar, 1 oz.
Sugar, ½ oz.
Wine, 1 oz.
Water, to a pint.

For a drink in scarlatina and fever.

Acid, Citric.

This is the acid obtained from the juice of the lemon, *Citrus Limonum.* (See Lemon-juice.) It is a crystalline solid, and is apt to be confounded with tartaric acid. It may, however, be distinguished from it by the following test. Citric acid (in solution) does not precipitate a concentrated solution of any salt of potash, except the tartrate; tartaric acid will do so, as the bitartrate of potash is insoluble in water. Citric acid is an agreeable refrigerant. It may be used pure, or in the form of lemon-juice. It is employed to form effervescing draughts, an ordinary manner of exhibiting a grateful saline drink in fevers. Being mixed in solution with a solution of the carbonate or bicarbonate of any of the alkalis, it at once decomposes it; the carbonic acid being rapidly extricated in bubbles of gas, the citric acid remaining in combination with the base, as a citrate of potash, soda, or ammonia. If we wish the draught to be simply saline, we employ just the amount of acid requisite to neutralize the base, and no more. We may make it acidulous by having an excess of the citric acid, or alkaline by an excess of

the carbonate. In ordinary inflammatory cases it is best to have it neutral; in low fevers and eruptive disorders an excess of acid should be given; in gouty and rheumatic cases an excess of alkali. The rationale of this may be thus understood. In inflammations we employ a saline to diminish the excessive amount of *fibrine* present in the blood. In low fevers the blood is over alkaline, and we resort to an acid treatment. In gout and rheumatism there is too much acid in the system, and we give an alkali accordingly. The following are the proportions to be employed in an ordinary effervescing draught. One scruple (20 grains) of bicarbonate of potash to 14 grains of citric acid; one scruple of carbonate of potash to 17 grains; the same of sesquicarbonate of ammonia to 24 grains; of carbonate of soda, to 10 grains; of bicarbonate of soda, 1 scruple to 17 grains of the acid. (See Lemon-juice.)

(1.) Citric acid, 20 grains.
Sesquicarbonate of ammonia, 10 grains.
Water, ½ a pint.

Allow effervescence to subside. A cooling drink in fevers.

(2.) Citric acid, 20 grains.
Tincture of orange-peel,
Syrup, each, 1 dr.
Water, a pint.

An agreeable acid drink in fevers and inflammations.

Acid, Hydrochloric.

A volatile acid, consisting of chlorine combined with hydrogen (HCl). It is produced by heating sulphuric acid with any chloride, such as chloride of sodium (common salt). Hydrochloric acid is a vapour, and is employed in solution in water. With a base it forms a chloride, its hydrogen joining the oxygen of the base to form water. The strong hydrochloric acid is a caustic. One part with nine of distilled water forms *dilute hydrochloric acid,* which is used in small doses mixed with water, in fevers, and generally as a tonic. It is often employed as a gargle in putrid sore-throat, and diphtherite. The dose of the dilute acid is 10 to 40 drops. (See Nitric Acid.)

(1.) Hydrochloric acid, 1 dr.
Water, 1 pint.
Syrup, 1 oz.

In typhus and scarlatina, by ounce doses.

(2.) Dilute hydrochloric acid, 2 dr.
Infusion of calumba, 5½ oz.
Tincture of orange-peel, ½ oz.

A sixth part for a dose, in indigestion, or white deposit in the urine with nervous disorder.

(3.) Hydrochloric acid, 1½ dr.
Decoction of cinchona,
Compound infusion of roses, 3½ oz. each.
Honey of roses, 1 oz.

A gargle in diphtherite and malignant sore-throat.

(4.) Hydrochloric acid.
Honey, equal parts.

To touch the fauces with in diphtherite.

(5.) Dilute hydrochloric acid, 10 drops.
Chlorate of potash, 10 grains.
Water, 1½ oz.

A draught in ulceration of the mouth, throat, or gums.

ACID, NITRIC.

A strong acid obtained from its combination with potash, nitrate of potash, or *nitre*, by treating it with sulphuric acid. It is composed of nitrogen combined with oxygen (NO_5), and therefore contains the same elements as air, but chemically combined, not mixed. Like hydrochloric acid it is a vapour. The so-called nitric acid is a strong solution in water. It is a powerful caustic, destroying the part, and turning the skin yellow where it touches. Like other caustics it is a corrosive poison internally. But, mixed with water (in the proportion of 1 to 3), it forms *dilute nitric acid*, which is given as a medicine in doses of ten to forty drops, in a glass of water. It may be drunk through a tube, to prevent it from corroding the teeth. Nitric acid is used to form an acidulous drink in fevers, scarlatina, and measles. It is given along with hydrochloric acid in liver complaints and hypochondria.

(1.) Dilute nitric acid, 1 dr.
Syrup of orange-peel, 2 oz.
Water, 14 oz.

One to four oz. for a dose, according to age, in scarlatina, measles, typhus.

(2.) Dilute nitric acid, 2 dr.
Nitric ether, 2 dr.
Syrup, ½ oz.
Water, 7½ oz.

One-eighth to one-sixth for a dose thrice daily in common colds, dyspepsia, and fevers.

(3.) Dilute nitric acid, 10 drops.
Tincture of henbane, ½ dr.
Water, 1½ oz.

A draught for cough, and sore-throat.

(4.) Dilute nitric acid, 5 drops.
Dilute hydrochloric acid, 10 drops.
Inf. calumba, 1½ oz.

Draught in dyspepsia, hypochondriasis, liver disease, and inflammation of the kidney.

* Acid, Oxalic.

A crystalline acid, composed of carbon and oxygen ($C_2 O_3$), somewhat resembling Epsom salts in appearance, but may be known by its sour taste. It is highly poisonous, and rarely used in medicine. Chalk or whiting should be given, mixed with water, as an antidote to this, or any other acid. Oxalic acid is sold as *Salt of Sorrel*, to take out

stains. It should be kept out of the way of children or ignorant persons.

*ACID, PRUSSIC.

Prussic, or hydrocyanic acid, is a very powerful poison, causing death by convulsions. Ammonia is the antidote, of no use unless given at the moment. The dilute acid used in medicine contains two per cent. of the pure acid (which is very volatile) dissolved in water. It should never be used except in minute doses, and under medical direction.

ACID, SULPHURIC. *Vitriol.*

A strong mineral acid, consisting of sulphur and oxygen (SO_3). It is used in solution in water, and is obtained by burning sulphur in contact with a plentiful supply of oxygen, and receiving the vapour in water, in a leaden chamber, until saturated. The strong acid is caustic and corrosive. Having a powerful affinity for bases, it is employed to prepare other acids, displacing them from their combinations. This acid is caustic, but seldomer used for this purpose than nitric acid. One part mixed with thirteen of water forms *dilute sulphuric acid,* which is given in doses of ten to sixty drops, in a glass of water, as a tonic, &c. An acid drink in fevers may be formed from it.

(1.) Dilute sulphuric acid, ½ oz.
Syrup, 2 oz.
Water, 2 pints.

Mineral lemonade, a drink for fevers, hæmorrhagic diseases, diarrhœa, and *lead colic*.

(2.) Dilute sulphuric acid,
Tincture of orange-peel, each ½ dr.
Water, to 6 oz.

A quarter part to be taken after each action of the bowels in diarrhœa; or, in any other case, as an astringent.

(3.) Dilute sulphuric acid, 20 drops.
Sulphate of magnesia, 1 dr.
Sulphate of iron, 1 grain.
Water, 1½ oz.

A draught for bleeding from the nose, or other hæmorrhage.

(4.) Dilute sulphuric acid, 15 drops.
Decoction of cinchona, or
Infusion of calumba, 1½ oz.

A tonic draught, in debility or relaxation of tissues.

ACID, TARTARIC.

This is a crystalline acid, obtained from its combination with potash, the bitartrate of potash, or *cream of tartar*. This forms a deposit in grape-juice, during the fermentation which produces wine. Tartaric resembles citric acid, but is more irritant, and less adapted for medical use. It is, however, cheaper. It is used to make effervescing draughts, like the other, a tartrate being left in solution instead of a citrate. Common effervescing powders may be made with 25 gr. of the powdered acid, and ½ drachm

of bicarbonate of soda, kept in separate papers until desired for use. They should then be dissolved in separate portions of water, then mixed, and drunk effervescing. Such a dose may prove slightly aperient; but, to act on the bowels, it is combined with a dose of Rochelle salt (2 or 3 drachms). This is first mixed with the soda powder. These aperient effervescing powders are called SEIDLITZ POWDERS. (See Citric Acid, Lemon-juice, and Rochelle salt.)

(1.) Tartaric acid, 10 grains.
Bitartrate of potash, 20 grains.
Powdered gum arabic, 10 grains.
Sugar, ½ dr.

To be taken in barley-water, as a diuretic and refrigerant in fevers.

(2.) Bicarbonate of potash,
Tartaric acid, each 20 grains.
Syrup of orange-peel, 1 dr.
Water, 2 oz.

One quarter every three hours, in febrile affections of children.

* ACONITE.

All parts of the common Monkshood (*Aconitum Napellus*) are highly poisonous. The root has been dug up in winter, and eaten for horseradish, a mistake more than once attended with fatal consequences. Aconite is a sedative, and lulls pain. An alkaloid is extracted from it, which is the most

powerful of known poisons. This medicine should not be used by the uninstructed, or without direction.

Alcohol.

This is a volatile liquid, consisting of carbon, oxygen, and hydrogen ($C_4\ H_6\ O_2$). It is formed, along with carbonic acid, when saccharine liquids ferment. In contact with yeast, or any other ferment, the sugar disappears, and alcohol takes its place. The alcohol in wine proceeds from the sugar of the grape, that in beer from the sugar in malt. A small quantity of alcohol has an exhilarating and stimulating action on the human system; a larger amount causes intoxication. Malt liquors contain from 5 to 10 per cent. of pure alcohol, wines from 10 to 25 per cent. By distilling these, stronger liquors are obtained, called ardent spirits, as brandy (from wine), rum (from fermented molasses), whiskey and gin (from malt or potatoes). These contain from 51 to 54 per cent. of alcohol, and other volatile substances. By repeated distillation, or rectification, *spirit of wine*, or *rectified spirit*, is obtained. This has a specific gravity of ·838, and contains 82 per cent. 5 parts, mixed with 3 of water, form *proof spirit*, which, according to excise law, has a specific gravity of ·920. It contains 49 per cent. of pure alcohol. Rectified and proof spirit are used in preparing tinctures of various drugs. Lotions of spirit are used as cooling applications to inflamed

parts. In the form of brandy and wine alcohol is of immense use in sustaining the vital powers in low inflammations and fevers. (See Brandy, Wine.)

(1.) Rectified spirit,
White of egg, equal parts.

Applied to incipient bedsores.

(2.) Rectified spirit, 2 oz.
Solution of acetate of ammonia, 6 oz.

As a lotion to inflamed parts.

ALKALIES.

Alkalies, by combining with acids, form neutral salts, which are not possessed of any active properties. Thus alkalies are used to counteract acidity in various diseases, as acidity of the stomach, gravel, gout, and rheumatism. They weaken the system if continued too long. Potash, soda, and ammonia are the three alkalies. Their carbonates possess their properties in a milder degree. In a concentrated form the alkalies are caustic and corrosive, and can only be used externally. Ammonia, which is volatile, possesses stimulant properties. The alkaline earths, lime, magnesia, and their carbonates, are also used to neutralize acidity. Each of the alkalies is described in its alphabetical place.

ALTERATIVES.

This term is applied to some active medicines

which are supposed to alter the condition of the blood, and so to eradicate a disease from the constitution. They are used extensively in chronic (long-lasting) blood diseases, and may require to be administered for some time in repeated small doses. Such disorders as gout, rheumatism, syphilis, scrofula, dyspepsia, are especially under their influence. Mercury, and its compounds, form one group of alteratives. Iodine, iodide of potassium, and iodide of iron, make another. Cod-liver oil is an alterative article of food. Sarsaparilla, taraxacum, and other vegetables, are sometimes called alteratives.

ALUM.

This is a double salt, a sulphate of the earth alumina (the base of clay), combined with sulphate of potash. The crystals contain much water, which is often driven off by heat before using the alum. Alum is a powerful astringent, used outwardly as a styptic, and lotion to ulcers; internally, to restrain hæmorrhages and fluxes. A strong solution is applied to the eyes in purulent ophthalmia, or used as a gargle in ulcerating sore-throat.

(1.) Alum, 24 grains.
Dilute sulphuric acid, 12 drops.
Syrup, ½ oz.
Water, 3 oz.

Three teaspoonfuls for a dose, in hooping-cough.

(2.) Alum, 1½ dr.
Syrup of red rose, 1 oz.
Rose-water, 7 oz.

Tablespoonful for a dose in fluxes, hæmorrhages, and painters' colic.

(3.) Alum, 10 grains.
Dilute sulphuric acid, 10 drops.
Infusion of roses, 1½ oz.

A draught in diarrhœa or hæmorrhages.

(4.) Alum, 1 dr.
Infusion of roses,
Barley-water, 3 oz. each.

A gargle to be frequently used in relaxed sore-throat.

(5.) Alum,
Prepared chalk, each 1 dr.

A powder to be applied to relaxed or sore nipples; or may be inhaled into the nostril in bleeding from the nose.

(6.) Alum, 1½ dr.
Rosewater, ½ pint.

An astringent lotion, or injection.

ALOES.

The dried resinous juice of various species of aloe. The aloes of Socotra and Barbadoes are the best for medicinal use. Their properties are extracted both by water and spirit. Aloes has an extremely bitter, nauseous taste. It is an admirable purgative, causing often some griping. It

acts most on the large intestine, and is unfit for pregnant females. Ordinary full dose, five grains, but more may be given. It may be made up into pills, with an equal part of extract of gentian, forming *compound aloes pill*—the best for common use; or, with an equal part of soap, and some treacle, forming *aloes and soap pill*. Pills may be made similarly, with *myrrh*, with *assafœtida*, or with *sulphate of iron*. The two former are used in hysteria and amenorhœa as antispasmodic; the last is tonic and purgative. The *tincture* and *wine of aloes* of the shops are given in combination with other purgatives, in doses of 1—2 dr., and the *decoction* in 1 oz. dose.

(1.) Aloes, 20 grains.
Ipecacuanha, 8 grains.
Ginger, ½ dr.
Syrup, to make 16 pills.

One before dinner each day in indigestion with costiveness.

(2.) Aloes,
Colocynth,
Scammony,
Mercurial pill, of each, 15 grains.
Syrup, to make 12 pills.

One at bed-time as an occasional aperient.

(3.) Decoction of aloes,
Infusion of senna, each ½ oz.
Tincture of senna,
Tincture of rhubarb, each 2 dr.

An aperient draught.

AMMONIA.

This is a volatile alkali, which, though composed of nitrogen and hydrogen (NH_3), combines with acids to form salts like those of potash and soda. The vapour is very pungent, and brings tears to the eyes. Dissolved in water, it forms *liquid ammonia,* of which two kinds are used in medicine. The ordinary solution, called *sal-volatile,* is most frequently used. It is a powerful stimulant and restorative, given in doses of ½ dr. dissolved in water. The *stronger solution* is far more powerful; dose, about six drops in a wineglassful of water.

The *sesquicarbonate of ammonia* is a solid, which is volatile, and has the same odour. It is known as *smelling-salts,* and used to prevent fainting by the restorative action of its vapour. Dose, 5 to 10 grains, dissolved in water.

The *aromatic spirit of ammonia* of the druggists contains the carbonate along with aromatics. It is the most agreeable form of administering the drug. It is often called *sal-volatile,* like the other liquid just mentioned. Its dose is a teaspoonful (1 dr.) in a glass of water. Used in faintness, hysteria, nervous disorders, vertigo, sinking of the vital powers. Ammonia is an alkali, and may thus be used as a chemical antidote in acidity of the stomach, being safer and more agreeable than potash. An over-large dose causes vomiting.

(1.) ~~Solution~~ of ammonia, ½ dr.
Tincture of ginger,
Tincture of calumba, each 1 dr.
Water, to 1½ oz.

A draught for fainting, giddiness, sinking at the stomach, or hysterical fits.

(2.) Sesquicarbonate of ammonia, 5 grains.
Bicarbonate of soda, 10 grains.
Infusion of calumba, 1½ oz.

In acid indigestion, or rheumatism.

(3.) Sesquicarbonate of ammonia, ½ dr.
Infusion of senega, 1½ oz.

In severe bronchitis, with difficulty of breathing.

(4.) Aromatic spirit of ammonia, ½ dr.
Carbonate of magnesia, ½ dr.
Tincture of opium, 5 drops.
Gum Arabic, 10 grains.
Water, 1½ oz. Mix.

A draught in dyspepsia or nervous headache.

Ammonia, Acetate of.

Spirit of Mindererus, formed by dissolving the sesquicarbonate of ammonia in weak vinegar, is a solution of the acetate of ammonia. It acts especially on the skin, forming an admirable diaphoretic in fevers, inflammations, dropsies, and rheumatism. A profuse perspiration, produced by wrapping up the patient warm, and giving him from three drachms to an ounce of this solution in

a glass of water, will sometimes serve to bring the disorder to a crisis.

(1.) Solution of acet. ammonia, 2 oz.
Camphor mixture, 8 oz.

Two ounces to be take every six hours as a diaphoretic in fever.

(2.) Solution of acet. ammonia, ½ oz.
Nitric ether, ½ dr.
Water, 1½ oz.

Every four hours in fever, or a severe cold.

ANTIMONY.

The oxide of this metal is contained in James's Fever Powder, or *compound antimonial powder.* Its dose is from 3 to 10 grains. It is given as a diaphoretic in fevers and inflammation, but is not always to be relied on. (See Tartar Emetic.)

(1.) Antimonial powder, 3 grains.
Calomel, ½ grain.
Extract of henbane, 1½ grains.
Make a pill.

Every four hours in acute rheumatism, and fevers with dry skin.

ARNICA.

The dried flowers of the *mountain arnica,* a plant common in hilly parts of Europe, are irritant and poisonous if taken internally. *Tincture*

of arnica is made by macerating two ounces of the flowers or root in sixteen ounces of proof spirit for seven days. By mixing one drachm of this with two ounces of water, *arnica lotion* is made, which is applied to bruises to stimulate the part, and promote recovery. It is said to be a sovereign remedy for a "black eye."

* ARSENIC.

White arsenic, or *arsenious acid,* is a combination of the metal arsenic with oxygen. It is a dangerous irritant poison, for which reason its use has been restricted by an Act of Parliament. In minute doses, generally combined with potash, it is used by physicians in some intractable skin diseases; but it should never be resorted to without medical advice.

ASSAFŒTIDA.

A gum resin of a peculiarly nauseous odour and taste, which exudes from the root of an umbelliferous plant growing in Persia and Northern India. It is stimulant and antispasmodic, given in hysteria, flatulence, and nervous diseases of women. It is given in doses of 5—10 grains. *Assafœtida pills* are made of assafœtida, galbanum, and myrrh, equal parts, beaten up with conserve of roses. Dose 2—4 at a time.

ASTRINGENTS.

These are medicines which coagulate the blood, and corrugate the solid tissues, causing muscular fibre to contract, and diminishing the calibre of vessels. Applied externally to a bleeding part they check the bleeding. Taken into the stomach they do the same thing less effectually by reaching the part in the blood. At the same time they diminish secretions and arrest fluxes. The mineral astringents are the most powerful; sulphuric acid, alum, acetate of lead, and sulphate of zinc, are mentioned in this index. The vegetable astringents are much used in diarrhœa, mucous fluxes, and hæmorrhage from internal organs. The chief of them are tannic acid (which is contained in most of the others), gallic acid, catechu, kino, rhatany, logwood, tormentil.

*BELLADONNA.

The *Atropa Belladonna*, or deadly nightshade, is one of the most poisonous of our native plants. It is a powerful sedative, and causes delirium. Various preparations of it are used by oculists to dilate the pupil of the eye. Belladonna should not be employed by unscientific persons. In poisoning cases a strong emetic should first be given, and then draughts of animal charcoal mixed with water.

BISMUTH, NITRATE OF.

The nitrate of the metal bismuth is a heavv white

powder, insoluble in most liquids. It is chiefly used in pains of the stomach and bowels, and dyspepsia, to allay irritation of the mucous surface. It seems to do this in a mechanical manner, *i.e.*, by adhering to and covering it. Dose, 10 grains to 1 drachm, suspended in mucilage.

(1.) Nitrate of bismuth, 10 gr.
Gum water,
Almond mixture, each 1 oz.

A draught for pain in the stomach.

BORAX.

A peculiar mineral acid, called *Boracic acid*, is contained in the water of certain hot springs in Tuscany. Combined with soda it forms *biborate of soda* or *borax*, a salt much used as a flux for glass. It acts on the system much like other salines, but is thought to have a specially beneficial influence on mucous surfaces, like that of chlorate of potash (which see). It is applied in the form of *borax honey*, made with 1 dr. to 1 oz. of honey, to thrush of the mouth in young children.

BRANDY.

This is the spirit distilled from wine in France. It contains about half its weight of alcohol, and, being free from the oil of grain which malt spirits contain, is the purest and best form of spirit for use as a medicinal cordial. In some low fevers and

exhaustive diseases large quantities of brandy be given to the patient with benefit, and without producing intoxication. (See Alcohol, Wine.)

BROOM.

The tops of the common broom (*Scoparius*) have a bitter and nauseous taste. In large doses they are emetic and cathartic, but they are used in smaller doses as diuretic in dropsies, &c. The *decoction* (½ oz., water ½ pint) is used in 1—2 oz. doses. Or the *compound decoction of broom*, made with dried broom tops, juniper berries, and dandelion root, ½ oz. each, in water 1½ pint, boiled down to a pint. In this preparation the virtues of three diuretic herbs are combined.

BUCHU.

The leaves of species of *Barosma*, a genus of the Rue order, growing in South Africa. They are stimulant and diuretic, chiefly used in inflammation of the bladder with discharge of mucus. The *infusion of buchu* (1 oz. to 1 pint of boiling water) is given in 1 or 2 oz. doses. The tincture (5 oz. to 2 pints) in 1—2 dr. doses, mixed with water.

CALUMBA.

It consists of circular slices of the root of a plant of Mozambique. It contains an agreeable

capital tonic, better borne by the stomach than quinine in some cases. As it contains no tannin it may be prescribed along with preparations of iron. Tannin, contained in most vegetable bitters, decomposes these. The *infusion of calumba* (made with 5 dr. to a pint) is given in doses of 1½ oz. The *tincture* (3 oz. to 2 pints of proof spirit) is given in combination with other tonics; dose 1—3 dr.

(1.) Infusion of calumba, 1½ oz.
Tincture of calumba, 1 dr.
Dilute sulphuric acid, 5 drops.

A tonic draught in debility or feverish states with relaxation and moist skin.

CAMPHOR.

A peculiar odorous substance obtained from the wood of a kind of laurel growing in China. It is lighter than water, combustible, semi-transparent, volatile. In small doses it exhilarates and calms nervous excitement. It is used to calm the system in typhus and hysteric spasms. In large doses it is narcotic. Dose, in pills, gr. 5—10. *Camphor mixture* consists of ½ dr. rubbed up with 10 drops of rectified spirit (which enables it to be powdered), and then gradually with a pint of water. Camphor is slightly soluble in water. The dose is 1—3 oz. Or the *tincture* is given in doses of 10—30 drops (it contains 2½ oz. to the pint.) *Compound tincture of camphor*, called *paregoric*, is im-

portant on account of the opium which it contains. Each ½ oz. contains 1 gr. of opium. *Liniment of camphor* (1 oz. dissolved in 4 oz. of olive oil) is used as a stimulant application in chronic rheumatism, sprains, &c.

* Cantharides. *Spanish Fly.*

The preparations of Spanish fly are powerfully irritant, and poisonous if taken internally. They are mostly used outwardly, and have two kinds of action, according to the strength of the application or the quantity used. A moderate quantity causes redness and irritation of the skin only. To do this we may use the *cantharides liniment* (1 part digested with heat in 4 of olive oil), or mix some of the *tincture* (½ oz. to proof spirit 2 pints) with camphor liniment. A stronger application raises the cuticle of the part into a blister. The *cantharides plaster* of the shops is used for this purpose. Or the *vinegar of cantharides* (2 oz. macerated in a pint of acetic acid) is painted over the part with a camel hair brush. Blisters should not be used for young children. The plaster should be left on for twelve hours to produce its full effect. It is then carefully removed; and, if the raised cuticle be not broken, it may be snipped with scissors, to let out the serum beneath. It may then be healed by applying cold cream on lint, but surgeons sometimes keep a blister open by applying an irritating ointment.

A blister is applied to the skin, to cure or relieve a disease of an internal part beneath. Thus we use blisters to the chest in diseases of the lungs or heart, behind the ears in diseases of the brain, and so forth. The explanation is difficult, but it is supposed that the artificial external disease diverts the attention of the nervous system from the more dangerous inner one. At all events, blisters are of great use in internal inflammations of a chronic or lingering kind, occurring in grown persons.

(1.) Vinegar of cantharides, ½ oz.
Eau de Cologne, 1 oz.
Rose water, 1 oz.

A lotion to promote the growth of the hair, in tendency to baldness.

(2.) Tincture of cantharides, 3 dr.
Opodeldoc, 11 dr.

A liniment for chilblains.

(3.) Tincture of cantharides, 1½ dr.
Camphor liniment, 1½ oz.
Tincture of opium, 3 dr.

A stimulating embrocation to sprains, and to the belly in colic.

Capsicum. *Cayenne Pepper.*

The red seed-pod of a plant of the *Solanum* tribe, which grows in the West Indies. It is possessed of stimulant and irritant properties, and used with food as a condiment. The tincture (10 dr. macerated for

seven days in two pints of proof spirit) may be given in doses of ten to thirty drops in water in various forms of dyspepsia, or applied to the skin to cause redness or blistering.

(1.) Tincture of capsicum, 10 drops.
Tincture of ginger, 1 dr.
Spirit of ammonia, $\frac{1}{2}$ dr.
Water, $1\frac{1}{2}$ oz.

A draught for dyspepsia with pain in the stomach.

Castor-Oil.

A limpid, yellowish, fixed oil, of a peculiar odour and taste, obtained by expression from the seeds of the castor-oil plant (*Ricinus*), or *Palma Christi*, which grows in the East and West Indies. It acts as a mild but efficient purgative, in doses of $\frac{1}{2}$ oz. or more to adults, of 1 to 2 dr. for young children. It does not cause much griping or irritation. For this reason it is always preferred as a purge for pregnant women and delicate persons, or those labouring under some disease of the internal organs which would render any violent cathartic action dangerous. In ordinary constipation it is the best aperient; for the dose, when repeated, may be gradually lessened, whereas other purgatives become less active the longer they are used.

Castor-oil, when pure, is dissolved by one volume of alcohol.

CATECHU.

An extract made of the wood of the *Acacia Catechu*, which grows in India. It is an admirable astringent, on account of the large quantity of tannic acid which it contains. It is thus used in hæmorrhages and discharges generally. It dissolves in water. Dose, 10 gr. to ½ dr. A *compound infusion* is made of 6 dr. with 1 dr. of cinnamon, and a pint of boiling water. Dose, 1½ oz. The *compound tincture* is similar (3½ oz., cinnamon, 2½ oz., proof spirit, 2 pints). Dose, 1 to 2 dr.

(1.) Tincture of catechu, 6 dr.
Chalk mixture, 5½ oz.

Two tablespoonfuls after each evacuation, and using first a rhubarb dose, in diarrhœa.

(2.) Powdered cinchona, ½ oz.
Catechu, ½ oz.
Myrrh, 2 dr. Mix.

A tooth-powder, in sponginess of the gums.

CAUSTICS.

These are corrosive mineral substances used by surgeons to burn part of the surface of the body, when diseased. Nitric acid is one of the most powerful of them. Caustic potash liquefies, and spreads so far as to produce a wide sore. Nitrate of silver, or *lunar caustic*, is the best for ordinary use. It is applied to check inflammations of the skin, and mucous membranes (when they can be reached).

CHALK.

Chalk, so common in nature, is a *carbonate of lime.* Added to any acid, it neutralizes it, with evolution of carbonic acid, just as a carbonate of potash or soda would. Being less corrosive, it is safer as an antacid. It is applied externally, as a harmless powder, to inflamed surfaces of skin, ulcers, burns, and scalds. Suspended in water or mucilage, it is given internally in diarrhœa, to allay irritation, and neutralize acid secretions in the intestinal canal. *Chalk mixture* is made by mixing up ½ oz. of finely powdered chalk with 3 dr. of sugar, 1½ oz. of gum mucilage, and 18 oz. of cinnamon-water. Dose, 1½ to 2 oz. every four hours in diarrhœa, with aromatics, or rhubarb. (See Lime.)

CHAMOMILE.

The dried flowers of the common chamomile are used popularly as tonic and stomachic. "Chamomile-tea," the *infusion of chamomile,* is made with 5 dr. of the flower-heads steeped for ten minutes in a pint of boiling water. It is given in wineglassfuls. It may be used to assist the action of an emetic.

CHARCOAL. *Carbon.*

Vegetable charcoal is left as a residue after the slow combustion of wood. Animal charcoal is made by burning the bones, blood, or flesh of animals. The purest is made by burning bullock's blood.

Charcoal has a strong affinity for various gaseous and organic compounds, as colouring and odorous matters, and poisonous principles. *Charcoal poultice,* made by mixing it with a bread or linseed poultice, is used to remove the fetid odour from ulcers and sores. Charcoal is much employed on the large scale as a deodorizer. As an absorbent it is of use in diarrhœa and dyspepsia with acrid secretions, in dose of 10 gr. to 1 dr. or more. Animal charcoal is the only known remedy in vegetable poisoning. In poisoning by aconite, strychnia, belladonna, &c., give first an emetic of 20 gr. sulphate of zinc, then copious draughts of the charcoal, finely powdered, and mixed with water.

Chiretta.

A bitter plant, used in India as a tonic, and thence introduced here. May be used in the same cases as gentian, employed in the form of infusion or tincture in the same doses, when variety is desired.

(1.) Infusion of chiretta, ½ oz.
Nitric acid, dilute, 10 drops.

A tonic draught.

Chloric Ether.

The liquid known by this name is a solution of chloroform in six parts of rectified spirit. (See Alcohol and Chloroform.) It is an agreeable stimulant and diaphoretic, given in fevers and common

colds, in doses of ½ drachm, dissolved in water. In operation it resembles ether and nitric ether. (See Chloroform.)

(1.) Chloric ether, ½ dr.
Chlorate of potash, 10 grains.
Water, 1½ oz.

A draught in a common cold, or in fevers.

(2.) Chloric ether, ½ dr.
Dilute hydrochloric acid, 10 drops.
Water, 1½ oz.

A draught in inflammation of the throat, or diphtherite.

* CHLOROFORM.

This is a volatile ethereal liquid, the inhalation of which into the lungs produces insensibility to pain and narcotism. It is employed in surgical operations. Unless properly administered, it may cause sudden death, and should, therefore, only be administered by a medical man. From one to five drops in water may be drunk to prevent sea-sickness, and frequently it succeeds.

With spirit it forms chloric ether (see above).

CINCHONA. *Peruvian Bark.*

Peruvian bark was first brought to Europe in 1639 by the lady of the Viceroy of Peru. It was not generally known in this hemisphere until at least a hundred years after this. It is now

recognised as the most valuable remedy in the whole catalogue of drugs. There are a great many varieties of this bark, described as pale, yellow, and red barks, but all possess the same bitter property, though not in the same degree. They are obtained from small trees (of the genus *Cinchona*) growing in Central America and Peru. The best kind of bark with which we are acquainted is yellow bark, obtained from the *Cinchona Calisaya*, a tree first discovered and named by the recent traveller, Weddell. It grows mostly in Bolivia. This bark yields its peculiar bitterness both to water and spirit. It contains also aromatic and astringent principles, but it is to the bitter element that its medicinal renown is owing. This bitterness is due to two principles, or alkaloids, called *quina* and *cinchonia*. The first is the most important, and present in the largest amount. Being extracted from the bark by a chemical process, and then combined with sulphuric acid, it forms the well-known medicine, *quinine*. Cinchona and quinine (what is said of either applies to both) are the best of known tonics and antiperiodics. They act as direct antidotes to ague and periodic disorders; they are often of use in fevers; they restore the tone of the system in debility, by whatever cause produced. As in a vast number of cases of disordered health we need to make up for some want of power, for various reasons lost, it follows that there is scarcely a

limit to the use of this medicine but the discretion of the physician who prescribes it. But, as will be stated under the head of Quinine, there are certain symptoms which persuade us when they are present to postpone its use, or resort to another line of treatment.

The preparations of bark are necessarily more bulky than those of the crystalline principle extracted from it; but sometimes they are preferred to them, and prove more palatable to the patient. The *infusion of cinchona* is made by macerating 1 oz. of bruised yellow bark for two hours in one pint of boiling water, and straining. The *decoction* is made by boiling it for ten minutes. Dose of either, 1—2 oz. The *tincture of cinchona* (8 oz. to 2 pints proof spirit, for seven days) is prescribed in doses of 1 dr. to 3 dr.

Preparations of bark must not be given with alkalies, or with astringent medicines containing tannic acid, because these substances render the quina insoluble, and cause it to separate. (See Quinine.)

(1.) Decoction of cinchona, 1½ oz.
Dilute sulphuric acid, or
Dilute nitric acid, 10 drops.

A tonic draught.

(2.) Decoction of cinchona, 1½ oz.
Sesquicarbonate of ammonia, 10 gr.

A draught in atonic dyspepsia.

(3.) Decoction of cinchona, 1 oz.
Steel wine, ½ oz.

A restorative draught in debility from loss of blood.

CINNAMON.

The inner bark of a kind of laurel which grows in Ceylon. Cassia, an inferior variety, is obtained from China. Cinnamon contains an aromatic oil, and is used as a stimulant and stomachic, being given with other medicines in diarrhœa and dyspepsia. The dose of the tincture (3½ dr., proof spirit 2 pints) is 1—3 dr. *Cinnamon water* is employed as a vehicle for other mediums. It may be made, like the other aromatic waters, by rubbing up 2 dr. of the essential oil of cinnamon with 2 dr. of powdered flint, then with one gallon of distilled water, and filtering. *Aromatic powder*, dose 5—20 grains, is made by powdering together 2 oz. of cinnamon, 1½ oz. of cardamoms, 1 oz. of ginger, and ½ oz. of long pepper.

(1.) Tincture of cinnamon,
Tincture of ginger,
Tincture of orange-peel, each 1 dr.
Water, 1 oz.

A restorative draught.

COD-LIVER OIL.

The liver of the common cod-fish, when boiled

with water, yields a quantity of yellow or pale brown oil. It is obtained chiefly from the Newfoundland fishery. This oil has a peculiar odour and taste (it should not be rancid or dark-coloured). It differs from other animal oils, containing *propyline* as its base instead of *glycerine*. It also contains a small quantity of iodine. It has been much in vogue of late years as a remedy in scrofula, consumption, and chronic rheumatism. It assists the assimilative powers, and fattens the patient. In incipient consumption it is the best remedy that we possess. If the patient fattens on it the progress of the disease is often arrested. At all events, it can do no harm. But in advanced cases, with cavities, it is of little use. In consumption we may begin with a teaspoonful two or three times a-day, increasing the dose till a tablespoonful or more is taken thrice daily. In scrofula, and in atrophy of children, it is given in teaspoonful doses, alone, or with iodide of iron, one grain to a dose. In many skin diseases, in chronic rheumatic or gouty cases, and in diabetes, it often proves serviceable.

To remove the repugnance to its disagreeable taste, it may be floated on orange-wine, or milk, or coffee, or infusion of calumba with an acid, or made into a mixture with some carbonate of soda, gum, and spirit of nutmegs. If intended to do good, its use should be persevered in for weeks or months.

(1.) Cod-liver oil, ½ oz.
Solution of ammonia, 5 drops.

Twice a-day in diabetes.

(2.) Cod-liver oil, 3 dr.
Solution of potash, 20 drops.
Iodide of potassium, 5 grains.
Water, 9 dr.

Draught in chronic rheumatism, and scrofula.

COLCHICUM.

The bulbs and seeds of the Meadow Saffron (*Colchicum autumnale*), an English plant, are irritant, purgative, and poisonous in large doses. Colchicum has special power in arresting the progress of gout. It is chiefly used in this disorder, and in the various forms of dyspepsia accompanied with acid urine, which are attributed to a latent gouty tendency in the system. The *extract* is made by acting on the bulbs with spirit, and evaporating this solution. The *acetic extract* is made similarly with acetic acid. The dose of either is 1—2 grains three times daily. Four different solutions of colchicum are used in medicine. The *tincture,* made by macerating 5 oz. of the bruised seeds in two pints of proof spirit for seven days. The *ammoniated tincture,* made in the same way with aromatic spirit of ammonia. *Wine of Colchicum,* of 8 oz. of the sliced bulbs, and sherry wine two pints. The

dose of any of these is 10 drops to 1 dr., average dose 20 drops. The ammoniated tincture is the best. *Vinegar of Colchicum* is a weaker preparation more seldom used.

(1.) Acetic extract of colchicum, 1 gr.
Mercurial pill, 1 gr.
Rhubarb, 3 gr.
Syrup to make a pill.

Every night in gouty dyspepsia, or gout.

(2.) Tincture of colchicum, 20 drops.
Tincture of gentian,
Tincture of rhubarb, each 1 dr.
Water, 10 dr.

A draught in gout.

(3.) Ammoniated tinct. of colch.
Aromatic spirit of ammonia, each 20 drops.
Magnesia, 10 gr.
Gum arabic 10 gr.
Water, $1\frac{1}{2}$ oz.

A draught every night in gout.

COLOCYNTH.

This is the dried pulp of the fruit of the colocynth plant, of the cucumber tribe, growing in Northern Africa and the south of Europe. It is very bitter, and has a powerful purgative action. The *extract* is made by macerating it for some time in cold water, and evaporating the solution. Dose, given alone, or with other purgatives, gr. 5—10.

Compound colocynth pill is a good active purge. Powdered extract of aloes, 6 dr.; scammony, 2 dr.; cardamoms, ½ dr.; and extract of colocynth, 1 dr., are mixed into a pill mass with soft soap, 1½ drs. The dose is from 5—10 grains (*i.e.*, 1 or 2 pills).

(1.) Colocynth pill, 2 gr.
Mercurial pill,
Extract of henbane, each 1 gr.
Make a pill.

1—2 as a purgative, taken at bedtime.

COPAIVA.

Balsam of Copaiva is a resinous juice obtained from incisions into the stems of trees of the genus *Copaifera*, inhabiting Brazil. It is a thick yellow liquid of a strong odour. Its taste is so disagreeable that when given as a medicine it is generally enclosed in capsules made of gelatine. It is a stimulant in its action, and checks excessive discharges from mucous membranes. It may prove serviceable in bronchitis and in various forms of dyspepsia. But it is chiefly used in gonorrhœa, over which disease, when the acute inflammatory stage is past, it exercises an almost specific control. The dose is 15 drops to ½ dr., enclosed in capsules, or made into pills with one-sixteenth part of magnesia.

CROTON OIL.

This oil is expressed from the seeds of the croton

plant (*Croton Tiglium*) which grows in the East and West Indies. Like castor oil, it is a fixed oil, soluble in alcohol. Like it, too, it is purgative, but it is far more active. It is so irritant, that when rubbed on the skin, it produces inflammation and an eruption of pustules. It is the most powerful of all cathartics except elaterium. Large doses are poisonous, and produce symptoms like those of cholera. The dose is 1—2 drops only. It is used in dropsies to cause copious evacuation of fluid from the bowels. In apoplexy a drop or two placed on the tongue may cause free purging, and so relieve the brain, when no other medicine can be administered to the insensible patient. It may be given similarly in mania or lockjaw.

CUBEBS.

A kind of pepper, obtained from India. It is an aromatic stimulant, and has the power of moderating excessive discharges from mucous surfaces. It is chiefly used in gonorrhœa, but must not be given till the active inflammation has subsided. The dose of the powder, given with treacle as an electuary, is 20 gr. to 1 dr., three times daily.

DIAPHORETICS.

These are medicines which promote the function of the skin, and tend to cause sweating. Antimony (tartar emetic), ipecacuanha, and opium, in small

doses, are admirable diaphoretics. Another group is formed of salines, as acetate of ammonia and nitre. Nitric ether, chloric ether, and wine, are spirituous diaphoretics. Senega, guaiacum, and some other vegetable products, act on the function of the skin. It is often desirable to promote this in fevers and inflammations. Mild cases are sometimes cured if we can cause sweating. To do this the patient must lie in bed, be warmly covered, and drink copiously of warm fluids. Hot baths and vapour baths are powerful means of causing sweating. They are not to be used without cause, as they reduce the strength.

DIURETICS.

These are agents that act on the kidneys and promote diuresis. When we wish to assist this secretion, we must, if possible, reverse the conditions that will favour an action on the skin. The erect posture, a cool surface, thin clothing, moderate exercise, promote diuresis. Nitric ether and wine, turpentine, juniper, and copaiba; buchu and broom; salines, such as nitre and chlorate of potash; cantharides in small doses, and squills, are diuretic.

ELATERIUM.

Elaterium is the unripe fruit of the squirting cucumber, a native of the south of Europe, cultivated in England. Its *extract*, used in medicine, is

obtained by slicing the fruit, collecting the juice, allowing it to stand till the thick part subsides, then straining and drying this precipitated matter. It is thus prepared in thin flakes, greyish green in colour. It is the most powerful purgative known. Good elaterium produces copious watery purging in doses of one-twelfth to one-eighth of a grain. It is resorted to in dropsies to diminish the amount of fluid in the system, and in brain diseases, where purgatives are our best aid.

(1.) Elaterium, 1 gr.
Rhubarb pill.
Extract of gentian, each 20 gr.
Make 12 pills.

In dropsy, one every four hours till effective.

EMETICS.

These agents evacuate the contents of the stomach. This may be desirable in cases of indigestion, in the early stage of an acute inflammation, or in suspicion of poisoning. For the first two cases the emetics in common use are tartar emetic and ipecacuanha. Much depression of the system, with sweating, is caused by this operation. To empty the stomach speedily, as in poisoning, we may tickle the throat with a feather, or give a draught of a teaspoonful each of mustard and salt, or give twenty grains of sulphate of zinc dissolved in water. The action of a vomit is promoted by draughts of warm water.

ETHER.

Ether, or *sulphuric ether*, a light volatile liquid of a peculiar odour, is obtained by heating spirit of wine with strong sulphuric acid. The latter has an affinity for water, which it abstracts from the alcohol ($C_4H_6O_2$). So that the ether, which distils over, is alcohol minus the elements of water (C_4H_5O). Ether may be used to cause insensibility by inhalation, but has been superseded as an *anæsthetic* (sense-benumber) by chloroform. In small doses it is given as a stimulant and diaphoretic. Given in hysteria, colic, and asthma, in doses of 15 drops to 1 drachm, mixed with mucilage, or dissolved in spirit. *Compound spirit of ether* is made by mixing 8 oz. with 16 oz. rectified spirit and 3 dr. of ethereal oil. Dose ½ dr.—2 dr.

(1.) Ether, 3 dr.
Camphor mixture, 5½ oz.

¼ part for a dose, as a diffusible stimulant.

(2.) Ether, ½ dr.
Aromatic spirit of ammonia, 20 drops.
Tincture of cinnamon, 1 dr.
Water, 11 dr.

A stimulant and antacid in dyspepsia, headache, and palpitations.

(3.) Ether ½ dr.
Tincture of rhubarb, 2 dr.
Magnesia, 20 gr.

Gum arabic, 10 gr.
Water 1½ oz. Mix.

A draught in pains of the stomach.

ETHER, NITRIC.

Nitric ether is a volatile liquid of a penetrating odour, and warm, sweet taste. It is obtained by distilling nitric acid with rectified spirit. It is a diffusible stimulant, like ether. It acts on the kidneys, if the surface of the body be kept cool, on the skin, if it be warm and covered. It is chiefly used as a diaphoretic and stimulant in colds, fevers, and inflammations, but is not to be given when the pulse is very high. The dose is ½ dr. to 1 dr. with a saline, as nitre or chlorate of potash, generally.

(1.) Nitric ether, 1 dr.
Solution of acetate of ammonia, 3 dr.
Water, 1 oz.

Taken at bedtime, to cure a cold.

EXPECTORANTS.

These medicines promote the healthy action of the mucous membrane of the lungs and air passages. When it is inflamed, and pours out an unhealthy secretion, as in catarrh, an expectorant assists in the evacuation of this mucus in coughing, and amends the character of the product.

Antimony (tartar emetic) and ipecacuanha, given

in small doses, are good expectorants. Squill and tolu are often used for the purpose. Senega, and stimulants, as ammonia, are given to the old and feeble.

* FOXGLOVE.

The plant known by this name, one of the handsomest of English herbs, is a dangerous poison. It is sometimes used by physicians for its sedative action on the heart, but its administration requires great care.

* GAMBOGE.

A vegetable pigment, which is sometimes employed in medicine as a powerful cathartic. In large dose it is poisonous and dangerous. It is contained in *Morison's pills,* which have frequently caused death. We have to our hand so many admirable cathartics, which can be used with little danger, that we are under no temptation to resort to such medicines as gamboge or hellebore, except in extraordinary cases.

GENTIAN.

The root of the yellow-flowered gentian of Central Europe. It is a good simple tonic, and agreeable bitter. The *compound infusion* is made by macerating 2 dr. each of sliced gentian and dried orange-peel, and 4 dr. of lemon-peel, in 1 pint of

boiling water for an hour. An aromatic tonic. A *compound tincture* is similarly made with spirit. The *extract* is obtained by macerating for some time in cold water, then evaporating this solution. It is given in doses of 5 to 20 gr. in pills. Gentian wine, as made by druggists, contains cinchona and orange-peel as well as gentian. It is a good cordial tonic in ½ oz. doses.

(1.) Comp. infusion of gentian, 12 oz.
Comp. infusion of senna, 6 oz.
Comp. tincture of cardamoms, 2 oz.

Tonic and aperient mixture; dose, 1½ oz.

(2.) Infusion of gentian, 1½ oz.
Tincture of gentian, 1 dr.

A tonic draught.

GINGER.

The root-stock of a plant of the East and West Indies. Whether fresh or dry it has a hot, pungent taste, and is used as a spice or condiment. The *tincture* and *syrup* are cordial in dyspepsia, and used as adjuncts to other medicines. A ginger plaster is a popular remedy for sore-throat, pain in the chest, &c.

(1.) Tincture of ginger, 1 dr.
Tincture of orange-peel, 1 dr.
~~Solution of~~ ammonia, ½ dr.
Water, 10 dr.

A draught in dyspepsia with pain or flatulence.

GLYCERINE.

A sweet oily liquid, which mixes with water. It is the base of fatty matters which remains after the separation of the fatty acid, as by makers of soap, candles, lead plaster, &c.

It forms an admirable emollient application to chaps, cuts, eruptions, &c. Sometimes it is given internally to weakly children, to fatten them, as cod-liver oil, over which it has the advantage of being agreeable in taste.

(1.) Glycerine, 2 oz.
Gum arabic,
Chalk, each ½ oz. Mix.

An emollient application to chaps, excoriations, and burns.

GUAIACUM.

A gum resin obtained from the stem of the guaiac tree of the West Indies. It is greenish and glassy in appearance, acrid to the taste. It scarcely dissolves in water, but, when prescribed, must either be suspended in it, or dissolved in spirit. Guaiacum is diuretic and diaphoretic. It is chiefly used in rheumatism, sometimes in syphilis and skin diseases. Dose in powder, 10 to 20 gr. To form *guaiacum mixture* 3 dr. of this are triturated with 4 dr. of sugar and 2 of powdered gum, then gradually with 1 pint of cinnamon-water. Dose, 1 oz. three times daily. The aromatic spirit of ammonia

forms an excellent solvent of this gum. 7 oz. in 2 pints for seven days forms the *compound tincture of guaiacum,* an admirable remedy in rheumatic cases. Dose, 1 to 2 dr. in some viscid fluid, as milk.

GUM ARABIC.

Gum resembles sugar in chemical composition. This is a pure kind of gum, which exudes from several species of *Acacia* growing in Africa. Gum is demulcent, and used in coughs, diarrhœas, strangury, &c. *Gum water* or *mucilage* is made by gradually mixing 10 oz. of powdered gum with a pint of boiling water, and letting it cool. This mucilage is used to hold in suspension insoluble powders, balsams, oils, &c., as is seen in the prescriptions of such medicines. Sometimes *tragacanth,* an insoluble form of gum, is employed to make a thicker mucilage. 2 dr. of tragacanth are macerated for twenty-four hours in 9 oz. of boiling water to make *tragacanth mucilage.*

(1.) Acacia mixture, 1½ oz.
Water, 3½ oz.
Syrup, ½ oz.

Demulcent for children, &c. A tablespoonful frequently.

* HEMLOCK.

The common hemlock, *Conium maculatum,* an English herb of the umbelliferous order, is dangerously

poisonous. It is sometimes prescribed as a sedative, but is too potent to be commonly used.

HENBANE.

The leaves of the common henbane (*Hyoscyamus*) are employed for their narcotic property. In large dose they are poisonous. The *extract*, made by carefully evaporating the expressed juice, is given in doses of 5 to 10 gr. The dose of the *tincture* (dried leaves, 5 oz.; proof spirit, 2 pints) is 10 drops to 1 dr. It is one of the narcotics, which, when in large dose, produce delirium, and not insensibility. It is not comparable to opium as a soporific, but it does not confine the bowels, nor produce congestion of the brain. It is thus given in some cases where opium is inadmissible. It is often of use in spasmodic cough, and in pains of various kinds.

(1.) Extract of henbane, 3 gr.
Extract of opium, ½ gr.
Extract of gentian, 1 gr.

An anodyne pill.

(2.) Tincture of henbane, ½ dr.
Nitric ether, ½ dr.
Dilute nitric acid, 10 drops.
Water, 1½ oz.

Anodyne draught for coughs.

HONEY.

This is a sweet viscid fluid, secreted by bees.

It may be used as food, but is slightly laxative. It is employed to make electuaries and to give an agreeable taste to nauseous medicines, like sugar. *Oxymel*, or vinegar and honey, may be made by mixing 15 oz. of vinegar with 5 oz. of honey. It is expectorant and diaphoretic, given with other cough-medicines in doses of 1 to 4 dr., but chiefly used in the form of Oxymel of squills (which see).

Honey of borax and *Honey of roses* are occasionally used in medicine.

IODINE.

Iodine is an elementary substance of a metallic appearance, which combines with the metals to form salts in the same manner as the gas chlorine, which chemically it resembles. It is slightly soluble in water, more so in spirit. Its solutions produce a blue colour with starch. Heat turns it into a violet vapour. It is caustic, turning the skin yellow. Iodine is contained in sea-water. It is obtained by a chemical process from kelp, the ash of seaweeds, after the separation of the soda.

Iodine and its compounds, given internally, may act as irritant poisons. But in small doses they are of great use in two classes of diseases. In scrofula and in syphilis (of the secondary stage) they form our sheet-anchor. Thus, in tumours, enlarged glands, and joint-inflammations, produced by scrofula; in periostitis, sore-throat, eruptions, and

ulcerations, produced by syphilis; iodine and iodide of potassium are our best medicines. The tinctures of iodine, which are caustic or irritant externally, are applied to the skin over swellings and inflamed joints. They turn the skin yellow, then brown, then cause it to peel off; and, at length, may cause the swelling or local disease to disappear, especially if scrofulous in its origin.

Iodine may be given in 1 to 2 gr. doses in a pill with some extract, but is rarely used thus in the solid form. The *Compound Tincture* is the best form for use (iodine 1 oz., iodide of potassium 2 oz., rectified spirit 2 pints). Dose, 10 to 20 drops in water, &c. It must not be given in farinaceous fluids. The *Compound Ointment* (iodine ½ dr., iodide of potassium 1 dr., rubbed with spirit 1 dr., then lard 2 oz.) may be used externally, or the tincture applied with a camel-hair brush. Other stronger spirituous solutions are employed. (See Iodide of Potassium.)

IPECACUANHA.

The thin brown root of a plant growing in Brazil. It is distinguished by a number of rings in the bark. In large doses ipecacuanha is emetic, in small doses diaphoretic and expectorant. Thus it resembles in its action the compound of antimony called tartar emetic, but it is much less powerful. It contains a chemical principle called *emetine*, about 1 per cent. Emetine is as strong as tartar emetic. Its emetic

operation is accompanied with nausea, prostration, relaxation of the muscular system, and sweating. It is used simply as a diaphoretic in fevers and inflammations, as an expectorant in bronchitis and asthma, in dose of 1—2 gr. As an emetic, 10—30 gr. are given, in warm water. *Ipecacuanha wine* (2½ oz. to 2 pints) forms a common mode of giving it. Dose, as expectorant and diaphoretic, 10—30 drops; emetic, 2—4 dr. To children, 20—60 drops are given, in a mixture, every quarter of an hour, till vomiting is produced.

Compound Ipecacuanha Powder, called *Dover's Powder*, contains both ipecacuanha and opium, of each 1 grain in 10, the rest sulphate of potash. The presence of 1 grain of opium in every 10 grains must never be forgotten. It is an admirable diaphoretic and sedative, of very common use in febrile disorders, generally given at night, when the patient retires to rest. With this powder *Ipecacuanha and Squill pill* is made (3 dr. of Dover's Powder, with squill and ammoniacum, each 1 dr., and treacle). It often does much good in bronchitis. Dose of Dover's Powder, 10 gr.; of the pill, 5—10 gr. Neither should be given to children, or in other cases where opium is inadmissible.

(1.) Ipecacuanha, 20 gr.
Ipecacuanha wine, 2 dr.
Water, 1 oz.

An emetic draught.

(2.) Ipecacuanha wine, ½ oz.
Syrup, ½ oz.
Water, 1 oz.

A teaspoonful every ten minutes, to cause vomiting in children.

(3.) Ipecacuanha wine, 3 oz.
Syrup of Tolu, 5 oz.
Gum-water to 16 oz. Mix.

A teaspoonful, frequently, as expectorant in bronchitis.

IRON. *Steel.*

Metallic iron in a finely-divided state, called *Quevenne's iron,* is sometimes given in doses of 5 to 20 grains, becoming dissolved by the acid of the stomach. *Steel wine* is wine made by digesting 1 oz. of fine iron wire in 2 pints of sherry for 30 days. Some of the iron is dissolved by the acid in the wine. It is a weak and variable preparation, given to children in doses of a teaspoonful to a tablespoonful.

All the compounds of iron, though they differ in strength, and some are more astringent and irritant than others, have the same medicinal action. When the red matter of the blood is deficient in quantity paleness (or *anæmia*) is the result. The whole system suffers, and debility and emaciation ensue from this state, which is commonest in young persons, especially girls. The red colour of the blood is due

to the corpuscles. These amount to twelve per cent. of the blood in health, but in anæmia their proportion is much reduced. These corpuscles contain the metal iron, to which their redness is supposed to be owing. And, when iron is given as a medicine it is used in making these corpuscles, so that their amount is increased, with great advantage to the general health and vigour. Iron is thus the great remedy for anæmia. It is called a tonic, but it is not of use in debility unaccompanied with paleness. Its use should be continued for some time, and accompanied with good living. It is often combined with quinine and other true tonics. Opening the bowels, by purgatives, prepares the system for its action. It is usual to administer each dose of iron after a meal, that it may not irritate the stomach by coming into immediate contact with it.

These remarks apply to all preparations of iron.

IRON, AMMONIO-CITRATE OF.

A double salt; citrate of iron with citrate of ammonia (see Citric Acid). It is prepared by druggists in elegant scales of a garnet colour. It is not disagreeable to the taste when dissolved in water. Ammonia may be prescribed with it if desired, for it does not precipitate this as it does the other salts of iron. The ammonio-citrate, too, is not irritant in any marked degree. These properties

render it most useful as a chalybeate for children and weak women. Dose, 5 to 10 grains.

(1.) Ammonio-citrate of iron,
Sesquicarbonate of ammonia, each 5 gr.
Tincture of calumba, 1 dr.
Water, 1½ oz.

A tonic draught in debility with paleness.

IRON, CARBONATE OF.

A most useful preparation. It is a combination of the protoxide (Fe O) with carbonic acid. It is made by adding a solution of carbonate of soda to one of sulphate of iron, when the insoluble carbonate precipitates. If exposed to the air the iron becomes further oxidized, the red oxide being produced. This is not desirable, as the carbonate is readily digested and dissolved by the stomach,—the red oxide with difficulty. By mixing sugar with the carbonate it is protected from the action of the air; thus sugar is contained in all the preparations used. The *Saccharine Carbonate,* made according to the directions of the Pharmacopœia, should be greyish-green in colour. The dose is gr. 5 to 30. The *Compound Iron Mixture* contains myrrh and nutmeg; 2 dr. of powdered myrrh are rubbed with 1 oz. spirit of nutmeg, and 1 dr. of carbonate of potash. There are added, rose-water 18 oz., sugar 2 dr., and sulphate of iron in powder, 50 grains. This mixture is kept in a stoppered bottle. It may be given in doses

of 1 to 2 oz., and is one of the best of the preparations of iron. *Compound iron pill* is similar. (Myrrh, 2 dr., carbonate of soda, 1 dr., sulphate of iron, 1 dr., treacle, 1 dr.), 5 to 10 gr. three times a-day.

Chalybeate waters of nature usually owe their virtue to the carbonate of iron, and may be drunk daily with advantage in suitable cases.

(1.) Compound iron mixture,
Infusion of quassia, each 6 dr.

A tonic draught in anæmia and debility.

(2.) Compound iron mixture,
Decoction of aloes, each ½ oz.

A draught for retained menses.

(3.) Compound iron pill,
Aloes and myrrh pill, 1 dr. each. Make 24 pills.

For retained menses, hysteria, and anæmia.

IRON, IODIDE OF.

A compound made by heating iodine and iron together in water, and in right proportions (126 iodine, 28 iron). When dry it is apt to decompose, with the formation of red oxide of iron. Its solution in water is green. Dose 1—5 gr., in syrup, cod-oil, or other medium. A *Syrup of iodide of iron* is prepared, which contains 5 gr. to the drachm. The sugar prevents it from decomposing. This is a valuable medicine, combining the properties of iodine with those of iron. It is thus used in scrofula and anæmia, especially when these are combined, as is so

frequently the case in infants, delicate children, and young persons.

(1.) Iodide of iron, 1 gr.
Cod-liver oil, 1 dr. Dissolve.

Thrice daily to scrofulous children.

(2.) Iodide of iron, 2 gr.
Extract of liquorice, 3 gr.
Make a pill.

One such to be taken every night, in anæmia.

IRON, SESQUICHLORIDE OF.

An irritant but efficacious salt of iron. It is chemically analogous to the sesquioxide, or common red oxide ($Fe_2\ O_3$), containing chlorine instead of oxygen, *i.e.*, two equivalents of iron to three of chlorine ($Fe_2\ Cl_3$). It is used in the form of a *Tincture*, easily made by dissolving 6 oz. of the pure sesquioxide of iron in one pint of strong hydrochloric (muriatic) acid, in a glass vessel (digesting for three days, with frequent shaking), and then adding three pints of rectified spirit. The dose is 10—40 drops in water. It must not be given with alkalis, nor with vegetable astringents, which turn it black like ink. With irritable stomachs it should be avoided.

(1.) Tincture of sesquichlor. iron, 20 drops.
Infusion of quassia, 1½ oz.
Tincture of calumba, 1 dr.

A tonic draught, in cases of paleness.

IRON, SULPHATE OF. *Green Vitriol.*

This well-known salt is a combination of sulphuric acid with the protoxide. It is astringent and irritant, but its cheapness and efficacy as a chalybeate recommend it for common use. 1—5 grains may be given in pills or solution. It must not be given with alkalis, nor astringent vegetables.

(1.) Sulphate of iron, 12 gr.
Extract of cinchona, or
Extract of gentian, 40 gr.
Make twelve pills.

One twice daily in anæmia (paleness).

(2.) Sulphate of iron, 2 gr.
Dilute sulphuric acid, 10 drops.
Water, 1½ oz.

A tonic draught in the same.

JALAP.

This is the tuberous root of a plant of the *convolvulus* tribe, obtained from Mexico. It yields a pale brown powder. It contains a peculiar resin, to which its medicinal property is owing. Jalap is an active cathartic, producing watery purging, but with a tendency to gripe. It is used in constipation, and frequently as a purge for children. It is adapted for employment in dropsy, where we wish to eliminate water from the system. It should not be used in pregnancy, nor should any irritant cathartic—(Castor-oil, always.) Dose of the powder, 10—30 grains;

or, for children, 3—5 grains. Of the *Extract*, or *Resin of jalap* (obtained by means of spirit), 5—20 grains for adults, in pills or powder. *Compound Jalap Powder* (jalap, 3 oz.; cream of tartar, 6 oz.; ginger, 2 dr., finely powdered together) is a good, active purge. Dose, rather more than of jalap alone. The *Tincture* is sometimes used in purgative draughts.

(1.) Jalap,
Rhubarb,
Aloes, 1 oz. each.
Soap, 2 oz.
Syrup, to make a pill mass.

Divide into 5-grain pills. Two for a dose.

(2.) Jalap, 3 oz.
Calomel, 1 oz.
Ginger, 2 dr.

5—20 grains of this powder for a dose; 2—5 grains for children.

(3.) Tincture of jalap,
Tincture of rhubarb, each 1½ dr.
Magnesia, 20 gr.
Water, 1½ oz.

A good purgative draught.

KINO.

A red astringent extract, obtained from certain trees which grow in India. Contains a large amount of tannin, and is more powerful than catechu as an astringent and styptic. Used in hæmorrhages and

fluxes, especially in those from the bowels. Dose, in powder, 10—30 grains. The *Tincture* is best adapted for use internally. *Compound Kino Powder* of the pharmacopœia contains 1 gr. of opium in 20 grains, and is used in diarrhœa and dysentery. Dose, 10—20 grains.

(1.) Powdered kino,
Alum,
Cinnamon,
Chalk, each 5 gr.

An astringent powder in diarrhœa and other fluxes.

(2.) Compound kino powder, 10 gr.
Inf. gentian, 6 dr.
Cinnamon-water, 6 dr.

A draught in dysentery.

LEAD, ACETATE OF. *Sugar of Lead.*

Lead exposed to the air, half immersed in vinegar, forms a white crystalline salt, with a sweetish taste. It is a combination of the oxide of lead with acetic acid. It is a good astringent in profuse discharges and hæmorrhages, in doses of 2—5 grains dissolved in water. If given for long, it causes symptoms of poisoning by lead, which commence with a blue line at the edge of the gums, and consist of colic of the bowels and palsy of the muscles of the wrist. Poisoning by *white lead* (the carbonate) is common with house-painters, who use this substance. The antidote for poisoning by lead is sulphuric acid, or a

sulphate, as alum. A drink may be given of a drachm of sulphuric acid in a gallon of water. A very insoluble sulphate of lead is formed.

Solution of diacetate of lead, or *Goulard's Extract,* is made by boiling acetate of lead, 2 lbs. 3 oz., and oxide of lead (litharge), 1 lb. 4 oz., in six pints of water till dissolved. Make up to six pints. It is used with water, to make astringent lotions and eye-waters.

(1.) Acetate of lead, 3 gr.
Compound soap pill, 2 gr.

A pill for hæmoptysis, or diarrhœa.

(2.) Acetate of lead, 2 gr.
Distilled vinegar, ½ dr.
Water, 1½ oz.

A draught for hæmoptysis, or sweating.

(3.) Acetate of lead, 2 gr.
Opium, ¼ gr.
Extract of henbane, 2 gr. Make a pill.

For the diarrhœa of consumption.

(4.) Solution of diacetate of lead, 15 drops.
Tincture of opium, ½ dr.
Rose water, 1½ oz.

A collyrium for inflamed eyes.

(5.) Solution of diacetate of lead, 1 dr.
Rose-water, 1 oz.
Spermaceti ointment, 2 oz. Mix.

An application to chapped hands and excoriations.

Lead Plaster. *Diachylon.*

It is a combination of the oxide of lead with fatty acids, made by heating the oxide (litharge) with olive-oil. It is used to form strapping to unite the edges of wounds, protect inflamed parts, and cover sores. *Resin plaster* is called *adhesive*, or *sticking-plaster*. It is made by melting 3 lbs. of lead plaster with ½ lb. of resin. It is softer and more adherent than the last, used in similar cases, but somewhat irritating.

Lemon-juice.

The juice of the lemon owes most of its properties to citric acid (*q.v.*). It contains also a volatile oil, which makes it more agreeable to the taste. Half an ounce of lemon-juice is equivalent to about 17 gr. of the pure acid in the formation of effervescing draughts. A scruple of each of the following salts requires, to neutralize it, the following proportions of lemon-juice:—bicarbonate of potash, 3½ drachms; carbonate of potash, 4 dr.; sesquicarbonate of ammonia, 6 dr.; carbonate of soda, 2½ dr.; bicarbonate of soda, 4 dr. (½ oz.). The bicarbonates of potash and soda are most frequently used. A tablespoonful of the juice will about saturate a scruple of either of these powders, which should first be dissolved in 2 tablespoonfuls of water. Lemon-juice is of great use in domestic medicine, and in ministering to the poor. With

two bulks of water it forms a good gargle in putrid sore-throat. Alone, or with an alkali in effervescence, it is an agreeable refrigerant in fevers and inflammations. With sugar, a little wine, and water, it is the best drink in scarlatina, measles, and typhus. It is of immense use in preventing or curing scurvy, being always used on board ships in long voyages, to protect the sailors from this terrible infliction. Lastly, it is one of the best remedies we possess in acute attacks of rheumatism, when $\frac{1}{2}$ oz. should be given three times daily till the pulse and the pain are reduced. (See Acid, Citric.)

(1.) Fresh lemon-juice,
Camphor mixture, each 1 oz.

One oz. at a time, in acute rheumatism.

Lime.

Lime, the oxide of the metal calcium, is one of the alkaline earths, and in action resembles the alkalies potash and soda. With a small quantity of water it produces great heat, and ultimately solidifies into mortar. Cold water dissolves more lime than hot water; a pint at 60° takes up nearly 12 grains. This is *Lime-water*. It is slightly caustic externally, used as a lotion to ulcers, and applied to check ringworm. (It must be kept from the air till wanted, else the lime attracts carbonic acid, and changes into chalk.) It is given in gravel and calculus, or gouty complaints, in dose of 2 oz. mixed with a glass of

milk to render it palatable. It neutralizes acidity of the stomach, or a tendency to a deposit in the urine. (But is not to be used in that kind of deposit which is dissolved by an acid.)

Lime-water mixed with olive-oil is applied to burns, under the name of *Carron oil.* (See Chalk.)

LIME, CHLORINATED.

It is also called *Chloride of lime and Bleaching-powder.* Made by passing chlorine gas into chambers in which lime is laid out on trays. It is a grey powder, with the taste and odour of chlorine. It dissolves in water, and the solution (1 lb. in a gallon) is used for deodorizing purposes. As a gargle in putrid sore-throat, or lotion to foul ulcers, it must be diluted for use. Added to the contents of sewers, cesspools, and other receptacles of fetid matters, sprinkled about apartments in which there is a bad smell, it neutralizes the odour by decomposing sulphuretted hydrogen gas. (The chlorine combines with the hydrogen to make hydrochloric acid.) Chlorinated lime, and Chlorinated soda (a similar compound) are often called *disinfectant.* They attack bad smells, but there is no proof that they destroy the contagious miasmata of diseases.

LINSEED.

The seeds of the flax contain a large quantity of oil and of mucilage. The oil being obtained by

strong pressure, the residue is termed oil-cake. This is powdered to form linseed-meal. Linseed-oil is emollient, and mixed with lime-water to form an application to burns. Linseed-meal is mucilaginous, and used to make *Linseed poultice*, an application made to wounds and inflamed parts which present an extent of surface of any size. Bread poultice is generally used to small surfaces. The proportion of linseed-meal for a poultice is 4—5 oz. to ½ pint of boiling water.

A poultice protects a part from the air, is soothing by its warmth and softness, assists to resolve inflammation, promotes healthy suppuration, and helps the healing of wounds.

LIQUORICE.

A sweet root, cultivated in England, and from which an extract is obtained in Spain, and largely imported into this country. The powder of the dry root is used in making pills, and the extract is employed commonly as a demulcent in catarrhs.

LOGWOOD.

The red chips of the wood of a tree in Campeachy are used in medicine under this name. It is a good mild astringent, well adapted for use in chronic diarrhœa and dysentery of children, or in spitting of blood, or sweating. The *Decoction* may be given in doses of 1—2 oz. (for young children 2—3 dr.). It

is made from 10 dr. of the chips boiled in 1½ pints of water down to 1 pint. The *Extract* is used like catechu and kino.

(1.) Decoction of logwood,
Chalk mixture,
Cinnamon water, each ½ oz.

Thrice a day in chronic diarrhœa.

MAGNESIA.

An insoluble white powder, dissolving in acids without effervescence. It is one of the alkaline earths, the oxide of the metal magnesium. Its carbonate occurs in nature in company with chalk and limestone, and the sulphate is in solution in sea-water. Magnesia is obtained by burning the carbonate. It is used as an antacid and cathartic. Especially adapted for irritation of the bowels accompanied with acidity of the stomach. Being insoluble, it has none of the caustic properties of an alkali, or of lime. Entering into the stomach, it neutralizes acid there. By this a salt of magnesia is formed, and it is this salt which acts as a purgative. If too much be given, or if taken habitually in too large dose, magnesia may form hard masses in the intestine. It is a good laxative, often combined with rhubarb, and well suited for children. Dose, 10—30 gr.; young children, 3—5 gr.

(1.) Magnesia, ½ dr.
Rhubarb, 15 gr.

Ginger, 5 gr.

Powder for habitual constipation.

(2.) Magnesia, 20 gr.
Aromatic spirit of ammonia, 20 drops.
Oil of caraways, 4 drops.
Peppermint-water, 1½ oz.
Syrup, ½ oz. Mix.

A teaspoonful every four hours in the flatulence and diarrhœa of young children.

MAGNESIA, CARBONATE OF.

This resembles the last in appearance, but is its carbonate. It is insoluble, but dissolves in acids with effervescence. Occurs in nature, but is prepared pure by precipitating a solution of the sulphate with carbonate of soda. There are two kinds, called *heavy* and *light*. The dose is the same as of magnesia. Its action is similar, but it is not so well adapted for flatulence, on account of the disengagement of carbonic acid gas as soon as it encounters the acid of the stomach. It is given as antacid in heartburn, dyspepsia, gout. As a purge or intestinal corrective, in diarrhœa, indigestion, &c., alone or with rhubarb. Magnesia and its carbonate are often confounded together, but may be distinguished as stated above.

(1.) Carbonate of magnesia, 20 gr.
Comp. infusion of gentian, 11 dr.

Tincture of orange-peel, 1 dr.

A tonic antacid draught.

(2.) Carbonate of magnesia,
Sesquicarbonate of ammonia, each 10 gr.
Spearmint water, 1½ oz.
Oil of caraway, 2 drops.
Syrup of ginger, 1 dr. Mix.

Antacid draught for stomach-ache, &c.

(3.) Carbonate of magnesia, 40 gr.
Sulphate of magnesia, ½ oz.
Tincture of henbane, 2 dr.
Bicarbonate of potash, ½ drachm.
Water, 6 oz.

One fourth part thrice daily in heartburn, &c.

MAGNESIA, BICARBONATE OF.

The liquids sold as *fluid magnesia* of Dinneford and Murray contain the bicarbonate, which differs from the carbonate in being soluble in water, and containing twice as much carbonic acid. To make them, carbonic acid gas is forced into water in which carbonate of magnesia is diffused. The liquid must be kept corked up; it is agreeable to the taste, and is in frequent use as an antacid and mild purge for gouty persons and dyspeptics. The dose is from ½ oz.—1½ oz.

(1.) Dinneford's solution, 1½ oz.
Tincture of sesquichloride of iron, 20 drops.

A draught to be taken twice daily for hysterical palpitation with anæmia.

MAGNESIA, SULPHATE OF. *Epsom Salts.*

A soluble crystalline salt of a bitter and disagreeable taste, contained in the water of some saline springs, and in sea-water in large quantity. It is now obtained from the last source. It is the simplest and best of the saline purges, though more disagreeable to the taste than Rochelle salt. In small dose it acts on the kidneys, in large dose causes copious watery purging. Like other salines it lowers the pulse, weakens the blood, and somewhat depresses the system. Hence it is called a *cooling* purge, and is adapted for use in inflammations (except those of the bowels) and a tendency to inflammation. With senna it forms the purgative combination in most common use, other simple ingredients being added to make *black draught*. Dose of salts, 1 dr. to 1 oz. if alone, dissolved in water.

(1.) Sulphate of magnesia, 3 dr.
Dilute sulphuric acid, 10 drops.
Syrup of orange-peel, 1 dr.
Water, 1½ oz.

A cooling purge.

(2.) Sulphate of magnesia, 6 dr.
Tartar emetic, ½ gr.
Nitric ether, 1 dr.
Water, 1½ oz.

An active nauseating purge.

(3.) Sulphate of magnesia, 6 dr.
Infusion of roses, 2 oz.

A purge in acute inflammations, at the onset.

(4.) Sulphate of magnesia, 2 dr.
Bicarbonate of potash, ½ dr.
Infusion of calumba, 1½ oz.

A tonic, antacid, and gentle purge.

MERCURY.

This liquid metal, in its ordinary state, has little or no action on the human system. But when rubbed up with some powder or viscous substance so as to reduce it to a state of fine subdivision, it becomes possessed of medicinal properties. In this condition it becomes partly oxidized, and the metallic appearance is wholly lost.

Mercury and chalk (3 parts to 5)—*Blue pill* (4 parts to 6 of confection of roses, and 2 of powdered liquorice root),—and *Mercurial ointment* (½ of mercury, with lard and some suet)—are all made in this way. Machinery is usually employed in the trituration, which is carried on till the globules are extinguished and a grey mass obtained. The dose of the first is from 5—10 gr. for adults, 1—4 gr. for children. Of blue pill, 5—10 gr. as cathartic and alterative. The ointment is used externally to cause salivation in syphilis, and to resolve tumours.

Blue pill and calomel (considered in next article) are the mildest preparations of mercury, and most

commonly used. Mercury and chalk is the preparation generally given to children, who take powders better than pills. These medicines are insoluble in water. The compounds of mercury which are soluble in water, as *Corrosive sublimate* (bichloride), are all poisonous. They are irritant and corrosive, and only to be given in very small doses, with great caution.

Mercury is one of the most important medicines we possess. (1.) It is of use more or less in all inflammations, as it tends to diminish the excessive amount of fibrine present in inflammatory blood. For this reason too, if long used, it causes wasting and leanness. (2.) It has a special action in primary forms of syphilis. It should be given (5 gr. of blue pill night and morning) till it slightly affects the mouth. Mercurial ointment rubbed into the inside of the thighs will produce the same result. (3.) It is of great use in gout and rheumatism, and all their forms. (4.) It is a purgative, used in common cases of dyspepsia, and all kinds of intestinal derangement. It does good by stimulating the flow of bile. (5.) It is diuretic, and stimulates all the other secretions, especially that of the salivary glands. Soreness of the mouth and gums, with a flow of saliva, is a proof that the mercury has acted sufficiently on the system.

(1.) Blue pill,
Rhubarb pill, 1 dr. each.

Make into 30 pills. Once or twice a day in indigestion

with constipation. Not to be continued long. (*This caution applies to all preparations containing mercury.*)

(2.) Blue pill,
Extract of henbane, each 3 gr.
Ipecacuanha, 1 gr.

Make 2 pills. An alterative purge and diaphoretic.

(3.) Blue pill, 3 gr.
Powder of squill, 1 gr.
Colocynth, 1 gr.

Make a pill. Twice a day in dropsies.

(4.) Mercury and chalk, 2 gr.
Rhubarb, 4 gr.
Cinnamon, 1 gr.

Make a powder. In disorders of children, as teething.

(5.) Mercury and chalk, 1 gr.
Prepared chalk, 2 gr.
Sugar, 2 gr.

Make a powder. In diarrhœa of young infants.

Mercury, Chloride of. *Calomel.*

This heavy white substance, insoluble in water, is a compound of one equivalent of chlorine (36 parts) with one of mercury (200 parts). There are several ways of making it, but the result is the same. It is one of the milder preparations of mercury, and, like blue pill, it is in very frequent use. Too often given, it debilitates the system. From its action on the blood, and its cathartic property, it purges away the grosser and unhealthy humours in many

disorders, and is thus called alterative. The dose as a mild alterative, ½—1 grain every night; in inflammations, 3—5 grains; cathartic, 5—10; larger doses still being given in cholera and fevers. When not desired to act on the bowels, it must be combined with opium. This is done in pleurisy and peritonitis. When wished to purge, it may be given with some simple cathartic, as senna. A dose of blue pill or calomel in the evening, and a senna draught in the morning, may be given in dyspepsia, constipation, &c.

(1.) Calomel, 1 gr.
Scammony,
Jalap, each 2 gr.
White sugar, 4 gr.

Make a powder. A good purge for children.

(2.) Calomel, 20 gr.
Opium, 5 gr.
Confection of roses, to make 20 pills.

One night and morning in syphilis (first symptoms).

(3.) Calomel,
Colchicum, extract of,
Aloes, each 1 gr.
Ipecacuanha, 2 gr.

Make a pill. One every four hours on an attack of gout.

(4.) Calomel, 12 gr.
Blue pill, 24 gr.
Squill powder, 36 gr.

Make into 12 pills. One thrice daily in dropsies, as prescribed by Sir Astley Cooper.

* MERCURY, BICHLORIDE OF. *Corrosive Sublimate.*
This is a very poisonous substance, as are all the compounds of mercury which are soluble in water. It contains twice as much chlorine as calomel. It is sometimes prescribed by physicians as an alterative, in very small doses. The antidote in cases of poisoning is the white of eggs (unboiled). As much of this should be administered as possible; it precipitates the mercurial compound, and neutralizes its corrosive property.

MINTS. *Spearmint, Peppermint, Pennyroyal.*
Three species of mint (*Mentha*), all growing in England, are used for their fragrant and bitter properties. The essential *oils* may be obtained from the fresh plants by distillation. From these oils the *waters* may be obtained, one drachm of the oil being intimately mixed with one drachm of powdered flint, and then rubbed up gradually with distilled water half a gallon. These are used as aromatic stimulants. The oils are sometimes taken in dyspepsia, heartburn, or pain in the stomach, flatulence, &c.; dose, 1—3 drops on sugar. The waters are used as agreeable vehicles for more powerful medicines.

(1.) Spirit of peppermint, 1 oz.
Peppermint-water, 4 oz.

Syrup, 3 oz.
Oil of cinnamon, 2 drops.
Oil of peppermint, 3 drops.

Carminative. A small spoonful every now and then in hiccough.

* MORPHIA.

This is the alkaloid, or pure active principle of opium. It is generally employed in combination with hydrochlorate or acetic acids, as the *Hydrochlorate* or *Acetate of morphia,* two white crystalline salts.

Morphia has much the same action as opium, but is more directly sedative. It is far more powerful, being a dangerous poison if incautiously used. It is given by physicians in doses averaging a quarter of a grain. In poisoning cases both opium and morphia cause death by *coma,* and produce at the same time contraction of the pupil of the eye.

MUSTARD.

The seeds of black and white mustard possess similar properties. When the powder or flour of mustard is brought into contact with water an acrid and pungent volatile oil is produced, which possesses stimulant and irritant properties. Mustard is in common use as a condiment, taken with animal food. In large dose it is emetic. A teaspoonful of the flour with a tablespoonful of salt in some warm

water forms a good rapid emetic in poisoning cases, and one which is generally at hand. Mustard-seeds are sometimes prescribed whole (1 to 2 dr.) in atonic dyspepsia. Applied externally mustard irritates and reddens the skin. It is thus employed in cases of internal inflammation, as a common sore-throat, in the form of *Mustard poultice* (mustard flour and linseed meal, each 2½ oz., stirred gradually with hot water 10 oz.). It should be kept on till it cannot be borne longer. Its effect is similar to, but milder than that of, a blister. (See Cantharides.)

MYRRH.

Myrrh is a balsamic gum-resin which exudes from a small tree growing in Arabia and Abyssinia. It comes to us through Bombay. It is brownish or yellowish, translucent when thin, of a peculiarly fragrant odour. Myrrh exerts a stimulant action on mucous membranes, restraining the mucous flux in bronchitis. It is antispasmodic, and given in hysteria. Dose, 10 to 20 gr.; rarely given alone. The *Tincture* (3 oz. to rectified spirit 2 pints) is used to make stimulating gargles in cases of relaxed throat.

(1.) Myrrh, 1½ dr.
Squill, ½ dr.
Extract of henbane, 40 gr.
Water, enough to make 30 pills.

Two at a time in chronic coughs.

(2.) Myrrh,
Vinegar, each 2 oz.
Honey, 1 oz.
Infusion of calumba, 1½ pints.

A gargle for putrid sore-throat, scarlatina, &c.

Narcotics.

Substances which affect the brain in such a manner as to dull the senses, causing stupor, are called narcotic. Most of them relieve pain, and some of them have a direct tendency to cause sleep, and are used for the purpose. Opium, morphia, and poppy are thus anodyne and soporific. Opium is not always safe. Its peculiar actions will be described in the article devoted to it. Henbane is a narcotic which relieves pain, but cannot be depended on to cause sleep. Chloroform relieves pain, and produces insensibility; it is given by inhalation to persons about to undergo serious surgical operations. Spirituous liquors are narcotics when taken in too large quantity. Instead of producing sleep, they cause intoxication.

Opium.

Opium is the half-dried juice, obtained by incisions into the unripe fruit, of the white poppy of the East, *Papaver somniferum.* The kind in most repute

is called Smyrna, or Turkey opium, and is obtained from Asia Minor. Large quantities of opium come from India. Opium has a peculiar heavy odour and bitter taste. When dried and powdered the powder is yellowish-brown.

This is one of the most important of all drugs, and the most frequently used in dangerous disorders. It is by no means to be given indiscriminately to all persons, and in all kinds of cases. In some cases its use is perilous; if carelessly administered by an uninstructed person, it may prove poisonous, and even cause death, in which case the verdict of the coroner's jury will be manslaughter, if not murder.

Opium is narcotic and sedative. Outwardly applied it lulls pain and diminishes irritation. Given internally in moderate dose, it first causes some transient excitement, with heat of skin, and quickened pulse. This is soon followed by a tendency to sleep, and diminished sensibility. Even if sleep be not produced, any pain that was present before is mitigated or removed. Any nervous irritation, or spasm of the muscular system, is counteracted at the same time.

Thus opium has three important actions. It causes sleep, it relieves pain, it obviates spasm.

At the same time it tends to lower the pulse, it diminishes the rapidity of the breathing, and it causes fulness of the head.

It has two peculiar actions on the secreting system. It *diminishes* the secretion of the bowels,

and so causes constipation, and obviates diarrhœa. It *increases* the secretion of the skin, and is frequently employed as a valuable diaphoretic.

Taken habitually, as by opium-eaters, the drug loses its usual action, and causes a dreamy kind of intoxication, with wasting. Taken in a large or poisonous dose, it produces a very deep sleep, from which the patient can hardly be roused. This at length becomes *coma*, or complete insensibility. Death at last takes place, with a gradual stoppage of the respiration. In poisoning cases a strong emetic should be given at once, and the stomach-pump used if it do not act; the patient is to be kept awake by continual shaking or walking up and down between two persons; strong coffee being given as soon as he can drink.

Opium is the best anodyne in cases of excessive pain; the best soporific in cases of sleeplessness; the best antispasmodic, too, that we possess. When there is fever, with dry and hot skin, quick pulse, furred tongue, it cannot generally be given (as its first operation is that of a stimulant). In diseases accompanied by a tendency of blood to the head, it must not be given (as it aggravates congestion of the brain). *It should not be given to young children,* as it acts very powerfully on them.

The physician gives it in pain without fever. A dose of castor-oil now and then will prevent the bowels from remaining too confined. In inflamma-

tions it is combined with antimony or mercury. So also in fevers, when the skin is moist, and the pulse not too high. In bronchitis it is given in small doses with ipecacuanha. It is *dangerous* when there is much difficulty of respiration, as often is the case in old persons.

It is used to check the evacuations in diarrhœa and dysentery. It controls delirium tremens, hysteria, chorea. Given with ipecacuanha, as in Dover's powder, it will often arrest a common "cold," by causing free perspiration.

Opium owes most of its efficacy to a peculiar principle, or alkaloid, called Morphia, which may be obtained from it, for separate use, by a chemical process. (It is precipitated from solutions containing opium when ammonia is added to them.) Good opium contains from 10 to 14 per cent. of morphia.

The dose of opium, given in powder or in pill, is about 1 grain. I repeat here the caution against administering it at all except under medical direction or advice. The safest form for frequent use is *Dover's powder* (see ipecacuanha), of which 10 grains contain 1 of opium. *Pills of opium* are made, containing 1 grain in 5. *Confection of opium,* with about 1 grain in 40. *Lozenges of opium* should not contain more than $\frac{1}{10}$ of a grain in each. The proportion of opium should be borne in mind while taking them.

Tincture of opium, or *laudanum,* is the most im-

portant fluid preparation of opium. Dose, 10 to 30 drops; average, 20 drops for an adult. Do not give it to children. *Wine of opium* is of about the same strength. Two other preparations are in frequent use in London, and are a little stronger than laudanum. They are *Battley's solution of opium,* and *Squire's solution of Bimeconate of morphia.*

Some preparations are resorted to by prescribers, which contain opium in reality, but not in name; so that they can be given without causing alarm to a sensitive patient, who may harbour some peculiar notion about opium "not agreeing with his constitution." It has been said that *Dover's powder* (pulv. ipecac. co.), and *Squill pill* (pil. scillæ co.) are among these (see Ipecacuanha). *Soap pill* (pil. saponis co.) contains 1 gr. in 5 of opium. *Storax pill* (pil. styracis co.), the same. *Compound tincture of camphor,* or *Paregoric,* used in coughs, contains 1 gr. in ½ oz. It must not be forgotten that each teaspoonful of paregoric contains ¼ of a grain of opium.

(1.) Opium, ¼ gr.
Calomel, 2 gr.
Confection of roses, to make a pill.

One every 3 hours in acute pleurisy.

(2.) Opium, ½ gr.
Camphor, 1 gr.
Syrup, to make a pill.

Anodyne and antispasmodic.

(3.) Opium, 1 grain,
Extract of Valerian,
Assafœtida, each 2 grains. Make a pill.

Once daily in hysteria.

(4.) Battley's solution, 20 drops,
Syrup of poppies, 1 dr.
Water, 1½ oz.

A sedative draught to be taken at bed-time. Never to be used when the patient can be induced to sleep by any other means.

(5.) Tincture of opium, 20 drops,
Ether, ½ dr.
Syrup of tolu, 1 dr.
Camphor mixture, 1½ oz. Mix.

An anodyne draught for severe pain or cough; not in high fever, or where respiration is impeded.

(6.) Tincture of opium, 5 to 10 drops.
Tincture of henbane, ½ dr.
Bicarbonate of potash, 5 gr.
Peppermint water, 1 oz.

Thrice daily in coughs and irritability of stomach.

ORANGE-PEEL.

The peel of the bitter or Seville orange, dried, is used as an aromatic tonic. 3½ oz., macerated for 7 days in 2 pints of spirit, makes *Tincture of orange-peel,* given in doses of 1 to 3 dr. in tonic and stomachic mixtures.

PAREIRA.

The wood of a plant of Brazil. Its *Decoction* and *Infusion* are mucilaginous, and slightly bitter. They are sometimes used in inflammation of the bladder, over which pareira is thought to exert a soothing influence.

(1.) Infusion of pareira, 8 oz.
Nitric acid, dilute, 40 drops,
Tincture of henbane, 2 dr.

An ounce for a dose in inflammation of bladder, with white or mucous sediment in urine.

POPPY

Poppy heads are the *ripe* capsules of the same poppy plant which produces opium. They are obtained from plantations of the white poppy in England. *Extract of poppies* contains morphia. It is made by evaporating the decoction. It is not quite so strong as opium. Dose, 2 to 3 grains; dangerous where opium is dangerous. *Decoction of poppies* is used warm as an anodyne fomentation to painful parts and swellings—(1 oz. of poppy-heads to each pint, boiled for $\frac{1}{4}$ of an hour). *Syrup of poppies* is made by boiling down 3 lbs. of poppy-heads in 5 gallons of water to 2 pints, dissolving in this sugar 5 lbs., and adding 5 oz. of rectified spirit. Given in 1 dr. to 2 dr. doses for cough, sleeplessness, &c., of adults. Often used for infants (10 drops),

but is *very dangerous* to them, as are all preparations containing morphia.

POTASH.

A caustic mineral alkali, very soluble in water, and having a strong attraction for it, as well as for acids. Potash is the oxide of a light, semi-fluid metal, called potassium, discovered first by Davy. All the salts of potash, except the bi-tartrate, are very soluble in water.

Potash exists largely in nature in the stems of plants. It remains in the ash of wood when burnt, in the form of a carbonate (KO, CO_2). Adding lime to a solution of this carbonate, chalk or carbonate of lime separates, and caustic potash remains in solution. A solution of sp. grav. 1·063, containing nearly 7 per cent. of the alkali, is the *Solution of potash* used in medicine. *Caustic potash* is made by evaporating the solution over a fire in an iron vessel until ready to concrete, then pouring it into moulds. It is in the form of sticks, which must be kept from the air, or they will deliquesce. When used, it must be held in an instrument, or kept from the finger by paper. It is powerfully caustic, on account of its affinity for water. Thus it abstracts from the living part the element of water, utterly destroying it, and forming a soapy slough. It is used by the surgeon to destroy parts, and encourage a fresh action in ulcerated surfaces. It removes corns, warts, &c.,

but is less safe for common use than nitrate of silver, because its action tends to spread all round the part to which it was first applied.

Potash, internally, in a concentrated form, is a corrosive poison, acting as a caustic on the stomach. In small doses, diluted with water, or given in milk or beer, it is an antacid, combining with acid matters in the stomach and elsewhere in the system. It is thus of use in dyspepsia, heartburn, and acid eructations (acid in stomach), in gout, rheumatism, gravel (acid in the system). It does good in small doses in scrofula, and in some skin diseases. Dose of the *Solution* (liquor potassæ), 10 to 40 drops.

(1.) Solution of potash, 1 dr.
Lime water, 6 oz.

A tablespoonful to be taken in broth or milk when there is a copious deposit of red gravel in the urine.

(2.) Solution of potash, 20 drops,
Chalk mixture, 1 oz.
Tincture of calumba, 1 dr.

A draught for acidity of the stomach.

(3.) Solution of potash, ½ dr.
Infusion of gentian, 1½ oz.
Tincture of gentian, 1 dr.

A draught for dyspepsia or acidity.

(4.) Solution of potash, 2 dr.
Nitrate of potash, 2 dr.
Nitric ether, 3 dr.

Syrup of squill, 6 dr.
Water, to 6 oz.

A tablespoonful in a glass of water thrice daily.

POTASH, CARBONATES OF.

The carbonate, or common potash (KO, CO_2), is obtained by the burning of wood in the forests of Russia and North America. It is corrosive, but less so than caustic potash. It is an antacid in doses of 10 to 20 grains, and may be given in effervescence with lemon-juice. The bicarbonate, containing twice as much carbonic acid as the other, is made by crystallizing a solution obtained by passing the gas through a solution of the carbonate. It is less corrosive and caustic than the other, and forms a mild and more agreeable remedy. It is used generally as an antacid. It is given as a cooling medicine in slight inflammations, alone in water, or in effervescence (see Citric Acid, &c.). But its chief use is in rheumatism of the acute kind, where it may be given in ½-dr. doses 3 times a-day. Ordinary dose, 10 to 20 grains.

(1.) Carbonate of potash, 1 dr.
Dill-water, 3 oz.

10 to 20 drops in some water for convulsions of infants.

(2.) Carbonate of potash, 2 dr.
Aromatic spirit of ammonia, 1 dr.
Cinnamon water, 4 oz.

A teaspoonful occasionally in water for acid eructations.

(3.) Bicarbonate of potash, 12 gr.
Magnesia, 6 gr.
Tartrate of potash, 15 gr.

A powder to be taken every evening in a glass of water, for gravel in the urine.

(4.) Bicarbonate of potash, 20 gr.
Tincture of henbane, ½ dr.
Infusion of pareira, 1½ oz.

For dyspepsia, acidity, and turbid urine.

(5.) Carbonate of potash, 2 dr.
Water, 8 oz.

A lotion for eruptions of the skin with itching.

POTASH, CHLORATE OF.

Chloric acid (ClO_5) resembles nitric acid (NO_5), substituting the gas chlorine for the gas nitrogen. Combined with potash, chloric acid forms this salt, which, on account of its detonating properties, is used to make percussion caps, &c. It occurs in small colourless scales, or crystals, soluble in 18 parts of water at 60°.

It is a good mild saline and alterative, probably operating like nitre. It is also diuretic and diaphoretic. In fevers, as scarlatina and typhus, where a more powerful medicine cannot be borne, it is often given. It is supposed to have a special control over *cancrum oris*, or inflammation of the mouth in

children. It has also been much recommended in common colds. Dose, gr. 10 to 20. For children, gr. 3 to 5.

(1.) Chlorate of potash, ½ dr.
Syrup, 2½ dr.
Water, 12½ dr.

Tablespoonful doses, in ulceration of the mouth in children.

(2.) Chlorate of potash, gr. 10.
Dilute hydrochloric acid, 5 drops.
Water, 1½ oz.

Every 4 hours, in scarlatina.

(3.) Chlorate of potash, 10 gr.
Nitric ether, or,
Chloric ether, ½ dr.
Water, 1½ oz.

Every 4 hours in cold in the head or sore-throat.

(4.) Chlorate of potash, 8 gr.
Common salt, 20 gr.
Bicarbonate of soda, 30 gr.

A powder every 3 hours, as a saline refrigerant in fevers.

POTASH, NITRATE OF. *Nitre.*

Nitre, or saltpetre, is obtained in nitre beds, where potash is left in contact with decomposing animal matters. The nitrogen of the latter oxidises into nitric acid, which combines with the potash. It crystallizes in colourless prisms, soluble in 4 parts of water, and having a cooling saline taste.

Nitre deflagrates in the fire, and is used in making gunpowder.

In medicine it is diuretic and cooling (*i.e.*, anti-inflammatory). Like other salines it diminishes the amount of fibrin and corpuscles in the blood, though not to the extent that mercury does. It is thus used in inflammations. In rheumatism, bronchitis, in a common cold, it may do good. It is given, too, as a diuretic in dropsies. Dose, gr. 5 to 20.

(1.) Nitre, 2 dr.
Barley-water, 1 pint.

As a cooling saline drink in fevers.

(2.) Nitre, 20 gr.
Syrup of poppies, 2 dr.
Water, 2 oz.

As a draught in bleeding from the nose, or vomiting of blood.

(3.) Nitre, 10 gr.
Camphor mixture, 11 dr.
Syrup of tolu, 1 dr.

A draught in bronchitis or fever.

(4.) Nitre, 2 dr.
Dilute nitric acid, 1 dr.
Barley-water, a quart.

To be drunk in the day, in the early stage of fever.

(5.) Nitre, 2 dr.
Barley-water, 7 oz.
Oxymel, 1 oz.

To be used as a gargle in ulceration of the throat.

POTASSIUM, IODIDE OF.

A crystalline white salt, consisting of iodine combined with the metallic base of potash. Care must be taken to procure it pure. The crystals are cubical, and the sides frequently excavated into hollow pyramids. It is very soluble in water; the solution gives a blue colour with starch and a drop of nitric acid. This salt is less irritant than iodine, and more adapted for medicinal use. It is the best (or only) known remedy in secondary syphilis, especially venereal nodes. It is used in scrofula, sometimes in rheumatism, and as a diuretic.

Dose, 3 to 10 gr. in water, or some simple infusion. It is contained also in the compound tincture and ointment of iodine.

A *Compound solution of iodine,* resembling the above tincture, is made of 10 gr. of iodide of potassium, 5 gr. of iodine, and 1 pint of water. It is much weaker than the other—(dose, 2 to 4 dr.). In Edinburgh a solution is in use which is of the same strength as the tincture.

This, and other compounds of iodine, tend to cause wasting if too long continued.

(1.) Iodide of potassium, 10 gr.
Infusion of calumba, 6 oz.

A quarter part twice daily in secondary syphilis. The dose of the iodide may be increased.

(2.) Iodide of potassium, 5 gr.
Tincture of cinchona, 1 dr.

Syrup of orange-peel, 1 dr.
Water, 10 dr.

A draught twice daily in the same.

(3.) Iodide of potassium, 1 gr.
Solution of potash, 5 drops.
Tincture of calumba, 15 drops.
Water, 1 oz.

For scrofula in children—with generous living.

(4.) Iodide of potassium, 3 gr.
Tincture of opium, 10 drops.
Nitric ether, ½ dr.
Water, 1½ oz.

A draught in chronic rheumatism.

(5.) Iodide of potassium,
Iodine, 1 oz. each.
Rectified spirit, 2 oz. A lotion.

To be applied to glandular enlargements.

PURGATIVES.

Purgatives, aperients, or cathartics, are medicines which increase the excretion of fœcal matters into the intestine, and promote their natural evacuation. Some medicines do this gently, others act with great violence, and cause copious liquid evacuations. Castor-oil, rhubarb, aloes, and senna are mild purges, adapted for ordinary use. Croton-oil and Elaterium are violent in their action, and used in dropsy and affections of the brain. Midway between the groups are colocynth, jalap, and scam-

mony. The latter two are given in small doses to children. Colchicum is a purge which is only used in gouty affections. In large dose it is poisonous. Blue-pill and calomel, mineral purges, combine with their action an alterative property, and an influence over the liver. Salines, as sulphate of magnesia and Rochelle salt, are another group of mineral purgatives. They are called "cooling purges," as they lower the system and counteract inflammations.

Quassia.

The light-coloured wood of a West Indian tree. It contains a bitter principle, which is dissolved out of it by hot water or spirit. It is a good simple tonic, not so powerful as quinine, nor of any use in ague. The *Tincture* is seldom used. The *Infusion* (40 grains of the chips to a pint of water) may be given in doses of 1½ to 2 oz. thrice daily. This is a good simple medicine for cases of weakness among the poor—indigestion, waterbrash, loss of appetite, rheumatism of old women. Each dose may be combined with 10 to 20 drops of *dilute* sulphuric acid, or with 1 gr. of sulphate of iron. Quassia, unlike many bitters, may be given with iron, because it contains no tannin.

Quinine. *Sulphate of Quinine.*

A sulphate, or, more properly, a *disulphate* of the alkaloid *quina*, contained in Peruvian barks, from

which it is extracted by a chemical process. (Quina consists of the four organic elements, having the composition $C_{20}\ H_{12}\ N\ O_2$). Quinine forms a flocculent and very light mass of white, needle-shaped crystals. To enable it to dissolve in water, it requires the addition of an acid. It is thus usual in prescriptions to prescribe a drop of dilute sulphuric acid with every grain of quinine given in a mixture or draught. This proportion is easily remembered.

As an ordinary tonic the dose of quinine is ·1—2 grains. It is given then in debility produced by any ordinary cause, as insufficient nutrition, rapid growth, change of life, climate, &c., or by exhaustive diseases, as consumption, cancer, purulent discharges. It is invaluable in the convalescence from fevers and acute disorders, when the stomach will bear it. In Ague it is given at the onset, between the paroxysms, often in dose larger than the above, as 5 grains at a time. This must be repeated when the attack of fever has gone off. *Quinine is of use in all disorders in which attacks of fever or pain recur at fixed intervals.* It is given between these intervals. Even in fevers, where there is no distinct remission, it is often used with advantage. But it is only safe to prescribe it when the fever has a little abated, as after a critical sweating, when the pulse is soft, and the skin still moist. It must not be given in high fever, when the pulse is quick and full, and the skin dry, with furred tongue. When it disagrees, it

causes nausea, or vomiting, aggravates the fever, produces headache, or even delirium. This will not occur when right precautions are taken. It is often advisable to dilute the dose copiously with water, to prevent irritation of the stomach. The operation of quinine is assisted by having the bowels freely open.

Quinine may be given alone, in a pill (made with conserve of roses), or in solution with sulphuric acid, and 1½ oz. of water to each 2 grain dose. The *Compound tincture of quinine* (quinine dissolved in tincture of orange-peel, 1 gr. in each dr.) is an elegant and agreeable mode of giving it. Dose, 1—2 dr. in water. Lastly, this medicine is often given in conjunction with iron, the best of vegetable with the best of mineral tonics. The *Citrate of iron and quinine* sold by druggists may be used in 5 grain doses in hysteria, anæmia, and other similar disorders.

(1.) Quinine, 8 gr.
Dilute sulphuric acid, 6 drops (mix).
Water, to 6 oz.

A quarter part for a dose, twice daily. The ordinary quinine mixture.

(2.) Quinine, 3 gr.
Infusion of roses, 10 dr.
Syrup of orange-peel, 2 dr.

A draught every 3 hours. To be given in Ague during the intermissions.

(3.) Tincture of quinine, 1 dr.
Tincture of calumba, 1 dr.
Tincture of ginger, ½ dr.
Water, to 1½ oz.

A draught every 4, 3, or 2 hours, on recovery from fever.

(4.) Quinine, 2 grains,
Sulphate of magnesia, 1 dr.
Dilute sulphuric acid, 5 drops,
Sulphate of iron, 1 grain,
Water, 1½ oz.

A tonic and aperient draught.

(5.) Quinine, 24 grains,
Conserve of roses, to make 12 pills.

One thrice daily, as a tonic.

RHATANY.

This is the astringent root of a South American tree of the genus *Krameria*. It yields its constituents to water, on evaporating which an *Extract* is obtained, which resembles kino, but is not so strong. The dose of this extract is twenty to thirty grains. An *Infusion* (1 oz. to a pint), and a *Tincture* (3 oz. to 2 pints), are used.

(1.) Tincture of rhatany, 2 dr.
Infusion of roses, 10 dr.
Dilute sulphuric acid, 10 drops.

An astringent and tonic draught in hæmorrhages or fluxes.

(2.) Infusion of rhatany, 7 oz.
Dilute sulphuric acid, 2 dr.
Syrup of red rose, 1 oz.

A gargle for relaxation of the uvula.

RHUBARB.

This is the root of several species of *Rheum*, some of which are grown in our gardens for their stalks. They belong to the dock tribe of plants. The yellow colour and peculiar taste of rhubarb are well known. The worst kinds are cultivated in England. The best is called Turkey rhubarb, but comes from China or Thibet, through Russia. Rhubarb contains both bitter and resinous matters. It is thus tonic as well as purgative, but is used for the latter quality. It is well adapted for use as a purge in dyspepsia and acidity of the stomach, being combined with magnesia in these disorders, with blue pill in gout. Its action is generally without griping, and is followed by a tendency to constipation. It is thus used in diarrhœa, where we desire this sort of action. Rhubarb is often used as a digestive in dinner pills, taken just before the meal. It is not well fitted for inflammations, or for pregnancy, though less objectionable in such cases than scammony or jalap. (In inflammations, use saline or mercurial purges; in pregnancy, castor-oil.) Dose for adults, 20 to 30 grains. An *Extract* is sometimes used for pills.

Compound rhubarb powder, or *Gregory's powder*,

consists of 4 oz. of rhubarb, with 1 lb. of magnesia and 2 oz. of ginger. Dose, 20 grains to 1 dr.; for children, 5 to 10 grains.

Compound rhubarb pill (4 dr., with aloes 3 dr., myrrh 2 dr., made into a pill-mass with soft soap ½ dr., oil of caraway 15 drops, and treacle) is a good cathartic in dose of 2 or 3 pills of 5 gr. each.

An *Infusion of rhubarb* (3 dr. to 1 pint) is sometimes given in doses of 1½ oz.

The *Compound tincture* (2½ oz., with liquorice 6 dr., ginger and saffron 3 dr. each, proof spirit 2 pints for 7 days) is a good stomachic in doses of 1 to 2 dr.

(1.) Rhubarb,
Calumba, each 10 gr.
Cinnamon, 5 gr.

To be taken every evening in dyspepsia.

(2.) Rhubarb, 15 gr.
Calomel, 3 gr.
Ginger, 2 gr.

Strong cathartic powder.

(3.) Rhubarb, 20 gr.
Carbonate of magnesia, 40 gr.
Cinnamon, 10 gr.

3 to 5 gr. every third hour, aperient for infants.

(4.) Rhubarb,
Ginger, ½ dr. each.
Extract of chamomile, 1 dr. Make into 30 pills. 3 before dinner in dyspepsia.

(5.) Rhubarb, 40 gr.
Ipecacuanha, 10 gr.
Syrup, to make 12 pills.

1 or 2 before dinner every day in dyspepsia.

(6.) Rhubarb,
Magnesia, each 15 gr.
Cinnamon, 10 gr.
Peppermint water, $1\frac{1}{2}$ oz. Mix.

An aperient draught.

ROCHELLE SALT.—See Soda, Potassio-tartrate of.

ROSE LEAVES.

The petals of two kinds of roses are used. From the sweet cabbage-rose, which came originally from the East, *oil* (or otto) *of roses* is obtained, and from this *rose-water*, used in perfumery, or as an agreeable vehicle for medicines and lotions.

The buds of the red or French rose are bitter and astringent. They are used fresh and dry. *Confection of roses,* employed as a base for pills, may be made by pounding them (fresh) with sugar. *Confection of dog-rose* is made in the same way from the pulpy part of the *hips* of our hedge-rows. *Compound infusion of roses* is made from the dried petals of rosebuds, 3 dr., boiling water 1 pint, dilute sulphuric acid $1\frac{1}{2}$ dr. Used alone as a tonic (dose, $1\frac{1}{2}$ oz.) or astringent gargle; more generally as a vehicle for quinine or saline purges. *Syrup of roses,* made from the sweet rose, is slightly laxative to

Another syrup, made from the red rose, is astringent.

RUE.

The common rue of the garden is well known for its strong smell and peculiar taste. The plant is stimulant and antispasmodic. It is well adapted for popular use in hysteria, colic, wind, suppressed menses, convulsions of children, &c. The leaves are to be used fresh. It is commonly used as a *Confection.* This is made of fresh rue, caraways, and bay-berries, 1½ oz. of each; black pepper, 2 dr.; sagapenum, ½ oz. (this may be omitted); all bruised, powdered, and mixed with 16 oz. of honey, and some water, if necessary. Dose in flatulence or colic, 20 gr. to 1 dr. *Oil of rue* is obtained by distillation. A *Syrup of rue,* useful in disorders of children, may be made by dissolving 12 drops of the oil in ½ oz. of spirit, and mixing with a pint of common syrup. Dose, a teaspoonful.

SAGE.

The common sage of gardens (*Salvia*) is a good aromatic tonic for popular use. The *Infusion,* or *sage-tea,* may be made with ½ oz. of the leaves to a pint of water. It is useful in indigestion, sweating from weakness, rheumatism of old persons, &c.

(1.) Infusion of sage, 1 pint,
Dilute sulphuric acid, 2 dr.

Honey of roses, 1 oz.
A gargle for relaxed uvula.

SARSAPARILLA.

It consists of roots of several species of the genus *Smilax*, imported from Central and South America and the West Indies. Jamaica sarsaparilla is the best. It has nutritive and alterative properties, and acts slightly on the skin and the kidneys. It is chiefly used in late syphilitic disorders, accompanied with wasting. The *Compound decoction*, or some similar preparation, is taken in doses of 2—4 oz. thrice daily. To make this, 10 oz. of the root are boiled in 8 pints of water down to 4 pints. Boil then for ¼ hour with 10 dr. each of sliced sassafras wood, rasped guaiacum wood, and bruised liquorice-root, and 3 dr. of mezereon root. Strain. A *Syrup of sarsaparilla* is sometimes prescribed in ½ oz. doses. Its use should be persisted in for some time, and accompanied with a generous diet.

(1.) Comp. decoct. of sarsaparilla, 4 oz.
Dilute nitric acid, 20 drops,
Tincture of henbane, ½ dr.

A draught twice daily in late syphilis.

(2.) Decoction of sarsaparilla,
Decoction of cinchona, each ½ oz.
Tincture of cinchona, 2 dr.

Tonic and alterative draught.

(3.) Extract of sarsaparilla,
Extract of taraxacum, each 3 dr.
Mercurial pill, 8 gr.

Make 48 pills. 3 to be taken thrice daily in tertiary syphilis.

SCAMMONY.

This, like jalap, is obtained from a plant of the *convolvulus* tribe, but the scammony plant grows in Syria. Jalap is a root, but scammony is the resinous matter which exudes from the root of the scammony plant, when cut for the purpose. It is much adulterated; but, when pure, is a powerful drastic cathartic, more active than jalap, but less unpleasant to the taste. It forms a common ingredient in purgative pills, combined with aloes, colocynth, or rhubarb. It is a good hydragogue in large doses in dropsics, a good purge in small doses to children. Dose, 5—15 gr.; for children, gr. 1—5.

Compound scammony powder contains 2 oz. each of scammony and hard extract or resin of jalap, and ½ oz. ginger. (See Jalap.) *Extract* or *Resin of scammony* is the purest form of the drug, obtained by the action of spirit, which dissolves about 80 per cent. of common scammony.

Scammony confection is made thus:—Powder together scammony, 1½ oz., ginger and dried cloves, 6 dr. each. When to be used, mix with ½ dr. oil of caraway, and as much syrup of roses as is neces-

sary. A good stimulating purge in doses of 20 gr. to 1 dr.

(1.) Scammony, 5 gr.
Calomel, 1 gr.
Sugar, 2 gr.

A cathartic powder.

(2.) Scammony,
Aloes,
Blue pill, each 2 gr.

Make 2 pills. An efficient purge.

(3.) Scammony, ½ dr.
Bicarbonate of potash,
Chalk, each 10 gr.
Cinnamon, 5 gr. Mix.

2—5 gr. for a dose in constipation of children.

SENEKA. *Senega.*

This is the root of a species of milkwort (*Polygala*) growing in North America. It has a slightly acrid taste, and contains an irritant principle. It is diaphoretic and expectorant. It is chiefly used in chronic bronchial affections, in which it facilitates the expectoration, and diverts the action to the skin. It is often combined in prescriptions with ammonia. The *Decoction of senega* (10 dr. in 2 pints, boiled down to 1 pint) is given in 1—3 oz. doses.

(1.) Decoction of seneka, 1½ oz.
Sesquicarbonate of ammonia, 5 gr.

A draught thrice daily for bronchitis of old persons.

(2.) Powder of seneka, 5 gr.
Bicarbonate of soda, 1 gr.
Powder of squill, ¼ gr.
Sugar, 3 gr.

A powder every fourth hour in barley-water, in hooping-cough and catarrh of children.

SENNA.

The small leaves of senna are produced by several species of the genus Cassia (plants of the pea tribe), which grow in Northern Africa, Arabia, and India. The two best kinds of senna are Tinnevelly senna and Alexandrian. Senna should consist solely of small, lance-shaped leaves, but little broken, with no mixture of rubbish. The leaves are green or brownish green, with a faint smell and taste somewhat disagreeable. Senna is an admirable purgative in very frequent use. It is active, and somewhat irritant. It may gripe. It clears out the small intestine as well as the lower bowel. It is too heating for inflammatory affections—(give salines); too active for advanced pregnancy and diseases of the womb—(give castor-oil); must not be used when we desire more especially to clear out the lower bowel—(give aloes); is too bulky in dose for young children—(give jalap); or when pills are preferred—(give scammony, &c.); is not rapid or powerful enough for apoplexy—(give croton-oil); does not evacuate enough fluid to be used in dropsy—(give colocynth or elaterium). These rules are useful

for general remembrance, but are occasionally departed from at the discretion of the practitioner.

Senna is the simplest purge for use in all ordinary cases, as indigestion, headache, low spirits, nervousness, simple constipation, gripings in the stomach or bowels, disorder from unwholesome food, bilious derangement, and so forth. It is not so much used in acute or dangerous disorders. The best guide to its repetition will be experience; but, as a general rule, no purgative should be frequently employed. Senna is generally given in infusion with a dose of a saline purge (Epsom salt or Rochelle salt) and some aromatic.

Compound infusion of senna is made of 15 dr. of the leaves, and $1\frac{1}{2}$ dr. of bruised ginger, macerated for an hour in one pint of boiling water in a covered pot, and strained. Dose, $1\frac{1}{2}$ oz. *Black draught* may be made out of this by adding to $1\frac{1}{2}$ oz. of the infusion 2 dr. of Epsom salts, and 1 dr. of either tincture of aloes or tincture of rhubarb. For another form see below.

Compound ~~*infusion*~~ Tincture *of senna* is made with senna $3\frac{1}{2}$ oz., caraways $3\frac{1}{2}$ dr., cardamoms 1 dr., stoned raisins 5 oz., and proof spirit two pints. Dose, 2—4 dr. 2 dr. may be added to a dose of the infusion.

Syrup of senna is an agreeable mode of giving the drug. To make it $3\frac{1}{2}$ oz. of senna are macerated with 10 dr. of bruised fennel-seed in a pint of

boiling water for six hours at a gentle heat—the liquor passed through linen, strained, and mixed with 3 oz. of manna. 3 lbs. of treacle are now heated until ready to concrete, and the above mixed in with stirring. It is a pleasant purge. Dose, a teaspoonful for a child, or two for an adult.

Confection or *Electuary of senna* requires care in its preparation, and should be obtained from the most respectable druggists only. It contains, besides senna, coriander, figs, liquorice, prunes, cassia pulp, tamarinds, and sugar. The dose is from one to two teaspoonfuls. It is chiefly taken by those subject to habitual constipation.

(1.) Tincture of senna,
Tincture of jalap,
Syrup of ginger, each 1 dr.
Sulphate of magnesia, 2—3 dr.
Comp. infusion of senna, to 1½ oz.

A form of *Black draught*. An efficient purge, given in the early morning after an aperient pill at night.

(2.) Comp. infusion of senna, 1½ oz.
Rhubarb, 10 gr.
Rochelle salt, 3 dr.
Syrup of orange-peel,
Tincture of ginger, each 1 dr.

A purge for robust persons; ½ oz. at a time to young children.

SILVER, NITRATE OF.

Crystals of this salt are obtained by dissolving silver in strong nitric acid. It should be kept in the dark. Most compounds of silver decompose and blacken in the light, and for this reason are used by the photographer. The nitrate is formed into sticks by being fused and run into moulds. It is then called *lunar caustic*. It burns parts to which it is applied, turning them slowly black. It is applied as a caustic to ulcers, unhealthy wounds, venereal sores, and inflamed surfaces of the skin or mucous membranes. A strong solution (5—10 grains in 1 oz. of distilled water) may be applied to the eye in purulent ophthalmia, or to the throat when ulcerated or highly inflamed. Nitrate of silver is given internally in doses of one-sixth of a grain to three grains, in epilepsy, and stomach diseases with pain. If long used it is apt to darken the skin.

SOAP.

Soap is the combination of an alkali with the acid parts of fats and fixed oils. Common soap is made with tallow and soda. Soap used in medicine should be made of olive oil, which with potash forms soft soap, with soda hard soap. This kind of hard soap is called Castile soap. Both this and soft soap are employed in medicine to make pills. Soap renders resinous matters (as in scammony, jalap,

aloes) more soluble in the secretion of the stomach. Soap may be used as an antacid alone, in dose of 5—15 grains.

SODA, CARBONATES OF.

Soda is the second fixed alkali, potash being the first. It is the oxide of a metal sodium, which resembles the metallic base of potash. It is commoner in nature than potash. It is found in the ash of plants, especially those growing near the sea, or in it. (This ash is called kelp and barilla.) But it occurs too in the form of common salt, in enormous quantities in sea water and elsewhere. Salt is a combination of chlorine with sodium; from it the carbonate of soda is now obtained by a chemical process.

Pure soda (without carbonic acid) is made like potash, but is not much used in medicine. In the arts it is employed to form soap, glass, porcelain, &c.

The *Carbonate* or common "soda," is a crystalline salt, very soluble in water, and with a soapy taste, largely used for household purposes. Dissolved in water it is antacid. In large dose, emetic. It is thus given for cases of pain in the stomach, or from gall stones, assisting its operation with warm water. It is the readiest antidote to acid poisons. Ordinary dose, 10—30 grains.

The *Bicarbonate* contains twice as much carbonic acid, and being more agreeable to the taste and less

corrosive, is generally used in medicine. As an antacid in gout, rheumatism, and urinary disorders, it is not so often given as the same salt of potash. In acidity of the stomach it forms a simple remedy. It is given as a cooling medicine in mild inflammations, as catarrh. (All alkalies are anti-inflammatory.) It is the alkali generally used to form effervescing draughts for fevers. (See Citric Acid, &c.) Dose, 10 gr. to 1 dr.

(1.) Carbonate of soda, 15 gr.
Rhubarb, 10 gr.

Powder to be taken before dinner in acid dyspepsia.

(2.) Carbonate of soda, 40 gr.
Barley-water, 1 pint.

Four glasses daily in skin diseases with itching.

(3.) Carbonate of soda,
Sesquicarbonate of ammonia, each 5 gr.
Tincture of calumba, 1 dr.
Infusion of calumba, 1½ oz.

Tonic antacid draught.

(4.) Bicarbonate of soda, 2 dr.
Camphor mixture, 8 oz.

Two tablespoonfuls every third hour in acute rheumatism.

(5.) Bicarbonate of soda, 15 gr.
Sesquicarbonate of ammonia, 5 gr.
Nitric ether, ½ dr.
Tincture of ginger, 1 dr.
Water, to 1½ oz.

For acidity of stomach, eructations, vomiting, and palpitation.

(4.) Bicarbonate of soda, 15 gr.
Water, $1\frac{1}{2}$ pints.

An alkaline lotion for skin diseases with itching.

SODA, POTASSIO-TARTRATE OF. *Rochelle salt.*

This is a double salt of potash and soda. Tartaric acid combines with 2 equivalents of a base. In cream of tartar, called bitartrate of potash, one equivalent of the acid is combined with one of potash and one of water. On adding to cream of tartar carbonate of soda, the soda takes the place of the basic water, and the carbonic acid escapes with effervescence. Rochelle salt crystallizes in large clear colourless crystals. It has a mild saline taste. It is diuretic and purgative. Given in 2 to 3 dr. doses to act on the bowels; generally in combination with some other cathartic, as senna. A senna draught, thus made with Rochelle salt, is more palatable than one made with sulphate of magnesia.

This salt is also given in Seidlitz powders. (See Tartaric Acid.)

(1.) Rochelle salt, $\frac{1}{2}$ oz.
Magnesia, 10 gr.
Peppermint-water, $1\frac{1}{2}$ oz.

A mild saline aperient.

SODIUM, CHLORIDE OF. *Salt.*

Common salt, obtained from sea-water and in mines, is a combination of chlorine with sodium, the metallic base of soda (Na Cl.). Na is the symbol of sodium, also called Natrium. Salt used to be called muriate of soda, because it may be made of muriatic (hydrochloric) acid and soda. The hydrogen of the acid and oxygen of the soda unite to form water, and chloride of sodium results. Salt crystallizes in colourless cubes; it has a peculiar taste, and is soluble in 2½ parts of water. It forms an article of food with all nations, being an ingredient of the blood of animals, and necessary for their health. Given in unusual quantities it acts as an alterative, useful in scrofula. Baths of salt water, warm and cold, stimulate the surface, and do good to delicate persons and weak limbs. A tablespoonful of salt in warm water constitutes a good extemporaneous emetic.

SQUILL. *Squills.*

Squill is the rootstock of a bulbous plant which grows on the coasts of the Mediterranean Sea. It contains an acrid principle, and is irritant in its nature. In large dose it is emetic, in ordinary dose it is an admirable expectorant, and very useful in bronchial disorders. It is also diaphoretic and diuretic. Squills form an ordinary ingredient in cough mixtures.

Dose of the powder of the dry root, 1 to 3 gr.

Compound squill pill contains 1 dr., with ginger and ammoniacum, 2 dr. each, soft soap, 2 dr., and treacle, 1 dr.; dose, gr. 5 to 15: a good expectorant. *Vinegar of squills* (2½ oz. macerated in vinegar, 1 pint, for 3 days, adding proof spirit, 1½ oz.) is given in ½ to 1 dr. doses. Evaporating 50 oz. of this to 12 oz., and mixing while hot with honey, 5 lbs., *Oxymel of squills* is formed. This is the preparation most used; dose, ½ dr. to 2 dr.

(1.) Squill, 2 gr.
Ipecacuanha, 4 gr.

A powder every two hours in chronic cough.

(2.) Compound squill pill, 10 gr.
Mercurial pill, 2 gr. Make two pills.

Dr. Baillie's pills, daily in dropsy.

(3.) Squill,
Colocynth, each 6 gr.
Croton oil, 1 drop. Make three pills.

To be taken twice a-week in dropsy.

(4.) Oxymel of squills,
Nitric ether, each ½ dr.
Water, 1 oz.

Every four hours in irritable cough.

(5.) Oxymel of squills, ½ dr.
Gum mucilage, ½ oz.
Ipecacuanha wine, 10 drops,
Bicarbonate of soda, 5 gr.

Tincture of opium, 5 drops.
Water, ½ oz.
A draught every four hours in chronic bronchitis.

(6.) Vinegar of squills, 1 dr.
Tincture of jalap, 2 dr.
Spearmint water, 1½ oz.
A diuretic draught, in dropsy, &c.

STIMULANTS.

These are medicines which excite the activity of the nervous system. They rouse the brain, and quicken the pulse. They are given in cases of exhaustion, and communicate the temporary strength needed to enable the system to bear up against a serious or lingering disease. Liquids containing alcohol, as brandy and wine,—ether, chloric ether and nitric ether,—and ammonia,—are used for this purpose. There are many less powerful stimulants, which are used to rouse the action of the stomach when torpid, as in flatulence. They are sometimes called carminatives. Most are vegetable, containing an aromatic oil: some contain an acrid principle. Of the former the chief are cinnamon, nutmeg, cloves, the mints, myrrh, assafœtida, valerian. Camphor resembles these. Of the acrids, there are ginger and capsicum, for internal use; mustard, and cantharides (animal), used to irritate the external surface, and produce blisters.

SULPHUR.

A yellow solid, fusible and crystalline, insoluble in water. It is obtained in volcanic districts, such as Sicily. It is combustible, and used to make gunpowder. Sulphur is a chemical element. With three equivalents of oxygen it forms sulphuric acid. With metallic bases it forms sulphurets. The sulphurets of the alkaline metals, potassium and sodium, are soluble in water. Sulphur, in small doses (10—20 gr.), is alterative and diaphoretic, useful in some chronic skin diseases, especially impetigo and scabies. In the last sulphur is reckoned a specific, being given internally, and applied externally to the parts affected in the form of *Sulphur ointment* (½ lb. with 1 lb. of lard). In larger dose (1—3 dr.) sulphur is a laxative cathartic, often given with confection of senna (which see).

(1.) Sulphur, 30 gr.
Bicarbonate of soda, 5 gr.
Ipecacuanha, 1 gr.

A laxative powder, on change of life.

(2.) Sulphur, 15 gr.
Magnesia, 20 gr.

To be taken at bed-time, in a glass of milk. Aperient, for piles.

(3.) Sulphur,
Liquid tar, each 1½ oz.
Soft soap,
Hydrochlorate of ammonia, each ½ oz.

Make an ointment. For itch and ringworm.

(4.) Sulphur, 5 oz.
Carbonate of potash, 2 oz.
Water, 1 oz. (Mix.)
Olive oil, 4 oz.

A liniment for itch, used in Paris.

(5.) Sulphur, ½ oz.
Carbonate of potash, 2 dr.
Lard, 2 oz.

Helmerick's ointment for itch.

TANNIC ACID. *Tannin.*

A crystalline principle, of feebly acid properties. It is soluble in water, and has an excessively astringent taste. It is, in fact, the substance to which nearly all vegetable astringents owe their astringent property. It coagulates solutions containing gelatine, and hardens and constringes animal tissues in which it is found. For this reason oak bark is used in tanning, converting skins into leather.

Tannic acid is obtained from nutgalls, which also yield *Gallic acid,* likewise astringent. Tannin may be used externally as a styptic to stop bleeding. Either it or gallic acid may be given internally, to check internal hæmorrhages, arrest mucous fluxes or sweating, or brace the muscular system. Dose, 5—10 gr., in solution in water.

(1.) Tannic acid, 12 gr.
Conserve of roses, ½ dr. Make 12 pills.

much as 2 or 3 grains, it reduces inflammations by weakening the heart. It is given in mixtures in the form of *Antimonial wine,* which contains two grains in an ounce. 10—30 drops in water act as expectorant, 30 drops to 1 dr. as diaphoretic, $\frac{1}{2}$ oz. produces vomiting. To cause vomiting in children $\frac{1}{2}$ dr. to 1 dr. may be given every hour until it operates. Tartar emetic is the best remedy we have in croup. It is of great value in acute bronchitis and inflammation of the lungs. It arrests the onset of many other local inflammations by depressing the heart and lowering the system.

(1.) Tartar emetic, 1 gr.
Ipecacuanha, 20 gr.

An emetic powder.

(2.) Tartar emetic, 3 gr.
Hot water, 6 oz.

To be taken in 1 oz. doses till vomiting is produced.

(3.) Tartar emetic, 1 gr.
Barley-water, 2 pints,
Syrup, 3 oz.

A nauseating drink for inflammation of the eyes, &c.

(4.) Tartar emetic, one-tenth of a grain.
Ipecacuanha, 1 gr.
Opium, $\frac{1}{4}$ gr.

Diaphoretic powder in fevers and inflammations.

(5.) Antimonial wine, 30 drops,
Ipecacuanha wine, 10 drops,

Paregoric, 20 drops,
Gum-water, 7 dr.

Two teaspoonfuls every 4 hours for hooping-cough in young children.

Tobacco.

The leaves of the tobacco plant, cultivated in America and Europe, are sedative and narcotic in their action on the system. They contain a volatile alkaloid, nicotia, which is extremely poisonous. The smoking of tobacco is extensively practised by men in most civilized nations. Very much has been written of its use and abuse. In moderation it has a calming and beneficial influence on persons of excitable temperament. It is most apt to disagree with sallow, bilious persons. In excess it causes various nervous disorders, and a loss of muscular power. Tobacco smoking is useful in spasmodic asthma. Infusion of tobacco has been given internally in hernia and colic, but is too dangerous to be often used. It depresses the action of the heart in a perilous manner.

Tolu Balsam.

This is a dry resinous substance or balsam, which exudes from a plant of the leguminous order inhabiting Peru. Balsam of Peru is similar, but semi-liquid. (It comes really from Guatemala.) Tolu is used chiefly as a stimulant expectorant in chronic forms of bronchitis. The dose is 10—30 grains, or

½ dr. to 1 dr. of the *Tolu tincture,* made by digesting it in rectified spirit, 1 oz. to the pint. When given in mixture, tolu not being soluble in water, it must be suspended by means of mucilage.

(1.) Syrup of tolu, ½ dr.
Gum mucilage, ½ oz. (Mix.)
Cinnamon water, 1 oz.

An expectorant draught in catarrhs.

TONICS.

These are medicines which restore strength and give general tone to the system. They are used in debility. Unlike that of stimulants their action is permanent. There are two kinds of tonics. The first kind consists of vegetable bitters, which have more or less power of curing ague and periodic fevers, besides being useful in debility. Cinchona bark, and its alkali quinine, are by far the most useful of these. Less expensive are other bitters; calumba, quassia, chiretta, gentian, orange-peel, tansy, sage. The last two form good febrifuge drinks for the poor. The other kind of tonics consists of the compounds of iron. These only do good in those forms of debility which are associated with anæmia (paleness). In such cases they excel all other tonics.

TORMENTIL.

The root of the common tormentil contains tannic acid, and is in popular use as an astringent. The

Decoction is made with 2 oz. to $1\frac{1}{2}$ pint, boiled down to a pint. A good remedy in fluxes and internal hæmorrhages in $1\frac{1}{2}$ oz. doses.

TURPENTINE.

Common turpentine is a semi-fluid substance which exudes from several trees of the pine tribe. It consists of resin and a volatile oil. The oil, or liquid part, may be separated by distillation.

Oil of turpentine is a limpid, volatile, odorous, inflammable fluid, consisting of carbon and hydrogen (C_{20} H_{16}). Applied externally it is irritant and rubefacient. *Turpentine ointment* is made by mixing 16 oz. of the oil with 1 oz. camphor and 2 oz. soft soap. Lint soaked in it is applied to burns, scalds, and indolent ulcers.

Taken internally, turpentine in small dose is diuretic and diaphoretic (10 drops to $\frac{1}{2}$ dr.). In large dose ($\frac{1}{2}$ oz. to 2 oz.) it is cathartic and vermifuge. Used for tapeworm, and in excessive flatulence. To be made into a mixture, each 2 dr. should be rubbed up with the yolk of an egg, and then with water. If given as cathartic it is best to prescribe it with castor oil.

VALERIAN.

The root of the common, wild valerian, when dry, is brown and fibrous, with a peculiar disagreeable

odour and bitter taste. It contains a peculiar volatile oil, and an acid, called valerianic acid.

Valerian is stimulant and antispasmodic. Its preparations are used in hysterical cases, in colic, and wind in the stomach. The dose of the *Infusion* (½ oz. to 1 pint) is 1 to 2 oz.; of the *Tincture* (5 oz. to proof spirit, 2 pints), 1 dr. to 3 dr. The *Compound tincture* is made with aromatic spirit of ammonia instead of spirit. Dose, ½ dr. to 2 dr.

(1.) Infusion of valerian, 6 dr.
Tincture of valerian, 1 dr.
Camphor mixture, 4 dr.

A draught thrice daily in hysteria.

(2.) Tincture of valerian, 1 dr.
Dilute sulphuric acid, 10 drops.
Tincture of cinchona, 1 dr.
Water, 1 oz.

For the same.

WINE.

Wine is an alcoholic liquid, produced by the natural fermentation of the sugar in the juice of the grape. Besides alcohol, it contains an ethereal constituent, which gives it its pleasant aroma, and varies in the different sorts of wines. Wine contains from 12 to 25 per cent. of alcohol, and is used as an exhilarating drink in all countries. Sweet wines, as Malaga, contain sugar unfermented. Dry wines, as the sherries of Spain, but little of this. Spark-

ling wines, as champagne and moselle, contain compressed carbonic acid, because bottled up before the fermentation has ceased. Sherry is the simplest wine for use as a restorative in medicine. Rhenish, and other wines which contain an acid, are prejudicial in gouty and dyspeptic cases. So is claret. Port wine, which contains the colouring and astringent principles of the skin of the grape, is considered more tonic and strengthening than sherry, and, therefore, much recommended for invalids. (See Brandy, Alcohol.)

Zinc, Oxide of.

The oxide of zinc, a heavy white powder, insoluble in water, may be made by burning the metal. It is applied in powder to sores, burns, and inflammations of the surface of the body, as a desiccative and mild astringent. *Zinc ointment* (1 oz. of the oxide with 6 oz. of lard) is in common use as a cooling and healing application to wounds, blisters, and ulcers. Carbonate of zinc, or calamine, is used in the same manner as the oxide. These two substances are rarely given internally, because insoluble.

Zinc, Sulphate of.

This salt is a combination of sulphuric acid with the oxide of the metal zinc. It forms colourless prismatic crystals, soluble in water, and with a styptic and metallic taste. Sulphate of zinc (like the

sulphates of iron and copper) is astringent, checking discharges and hæmorrhages. As a lotion (5 gr. to 3—6 oz. of rose-water), it forms a good styptic wash, or an eye-water in ophthalmia. Internally, in dose of 1—3 gr., it 's tonic and antispasmodic. It is given in epilepsy the dose being at first small, and increased gradually. In doses of 20—30 gr., in water, it is a quick emetic, and generally resorted to as a certain and rapid means of emptying the stomach in cases of poisoning.

(1.) Sulphate of zinc, 5 gr.
Rose-water, 6 oz.

A collyrium for weak or inflamed eyes.

APPENDIX.

SANITARY FACTS AND COUNSELS,

FOR THE ASSISTANCE OF CLERGYMEN AND DISTRICT VISITORS, IN GIVING ADVICE TO THE POOR.

A MAN can do more for himself than the doctor can. It is of no use to shut the stable-door after the horse is stolen. When sickness comes on, it is often too late to do good. When you are sick the aid of the doctor is necessary, but if you will only take care of yourself at all times, you will stand in little need of him.

The lives of 3,750 persons in Liverpool were saved in one year, after the Town Council had attended to the health of the town. What the Council did for the town each man may do for his family.

The more windows there are in a house the better. Human beings, like plants, were meant to live in the light.

The body makes heat for itself out of food; clothing prevents it from losing that heat. Clothing, in each

season, should be warm enough to prevent chilliness, not warm enough to cause perspiration. Linen clothes do not preserve the heat of the body so well as woollen. It is good at all times to wear flannel next the skin.

Blankets, which do not lose their power of keeping persons warm, are of more permanent use to the poor than coals. In the winter of 1860 a ton of good coals cost 25*s*. For this sum five or six serviceable blankets could be had.

Pure air is necessary to life. A man, by breathing, makes it impure. Fires, by burning, do the same. To keep it pure, we must have fresh air from without in our rooms. Air must always be allowed to enter a room somewhere. For this the open window is the best.

A grown man, in twenty-four hours, breathes 3,000 gallons (or cubic feet) of air. He makes this quantity unfit for further use by himself or others. It represents (about) the contents of a room fifteen feet square by twelve feet high. In the night, of eight hours, a man will consume 1,000 gallons—the contents of a chamber measuring ten feet every way. Thus, at least, this space is required for each inmate of a closed sleeping apartment. As so much is frequently not given, we see the necessity of free ventilation of bedrooms.

Breathing produces a poisonous gas. A man who shuts all his doors and windows, and stops up his fireplace in summer, is killing himself and his family by slow poisoning.

No animal or vegetable refuse, no excretions, should be allowed to remain in or near an inhabited dwelling: even when causing no smell, they may cause disease.

To live in a place where the wind is never felt, is bad.

To live quite surrounded by trees, or houses, is bad.

To live too near stagnant water, is bad.

To live on the ground, unfloored, is bad.

The higher the sleeping apartment the better. The attic is the healthiest room in a town house.

To drink plenty of pure water is a safeguard against many diseases, more especially gout, rheumatism, and stone.

To wash the whole body frequently in cold water (lukewarm in winter), is a protection against catching cold, and conduces much to health and strength.

To wash the house and all in it frequently, is a protection against fevers and other contagious disorders. The Dutch, who live in the most unhealthy climate in Europe, do much to keep themselves in health by this means. Stone and brick walls should be frequently lime-washed.

Food nourishes the body, and maintains its heat. All food is not equally nourishing; meat is more so than bread, bread than potatoes.

But a man cannot live on meat alone and be healthy.

A man may very well live on bread, or on milk; but some variety in diet is good for the health.

The amount of nourishment required to sustain the life of an adult for a day is contained in 3 lbs. of bread (cost, about sixpence). Brown bread is wholesomer and more nourishing than white.

The same amount of nourishment is contained in six pints of milk (cost, about sixpence).

The same is contained in 1 lb. 5 oz. of dried peas or beans (cost, about threepence).

To live on potatoes alone, a man must eat 21 lbs. in a day (cost, sevenpence).

Half-a-pound of meat, and 2 lbs. of bread, will sustain life for a day (cost, eightpence).

Considered simply as nutritive articles of food, peas are the cheapest ; oatmeal is the next cheapest ; next is wheaten bread. Rice is expensive, because not nourishing.

No person can live on jelly, or arrowroot, or sago, or tapioca.

Pies and pastics are unsuited for delicate persons and children.

In boiling meat, we should first raise the water to boiling point, then plunge the meat in it; otherwise the water in the pot will dissolve out the strength of the meat.

In making soup, we should first cut the meat into small pieces, then let it remain for some hours in cold water, then gradually raise this water to boiling.

Food will not nourish if eaten too fast, or without proper mastication.

Salt should be eaten with all fresh food.

Continual exercise of the limbs, and exposure in the open air, is good for the health, and will render life long, and medicine seldom necessary.

The milk of the mother is the best, and should be the only food of infants. The baby should be suckled about once every three hours in the day. It is better not to suckle at night. The child should be weaned after twelve months. To suckle it longer is bad for the constitution of the mother, and that of future children. For

six months more, pap and cow's-milk (not boiled) are the best food for the child. At this time, solid food does it harm.

All infants should be vaccinated when about three months old. The operation should be performed always by a medical man, who only is the judge of the right kind of matter to be used. Persons vaccinated in infancy hardly ever catch the small-pox. If they catch it, the disorder runs a mild course. Persons not properly vaccinated may at any time catch the small-pox, and then communicate it to others. They are dangerous to themselves and to the community. It is the bounden duty of all those who have care of the poor to see that this necessary and harmless operation is performed on all their children, and, if requisite, to enforce it by threatening the penalty imposed by the law. If the pits on the arm of any person are not perfectly marked, of which the doctor is the best judge, the person is not properly protected, and the operation should be performed again.

MEANING OF SYMPTOMS.

Appetite, Loss of.—Indigestion. Fevers and inflammations. (The appetite is nearly always lost in serious illness, and when good it is usually a sign that there is not much the matter.) Intemperance. Hysteria. Pregnancy.

Cough.—In catarrh, and in influenza. In consump-

tion (constant, with pain in upper part of chest, fever, and wasting). Asthma (with difficulty of breathing, in fits—generally at night). In pneumonia and pleurisy (with pain in the side, and fever). In croup of children (with dangerous inflammation of the windpipe, choking, and convulsions). In measles. In laryngitis (with hoarseness and sorethroat).

DELIRIUM.—From drinking. Bleeding, or any cause of exhaustion. In fevers, or any disorder accompanied with fever. Inflammation of the brain (with intense headache). Belladonna, and some other poisons.

GIDDINESS.—Weakness. Indigestion. Fevers. Tendency to epilepsy or apoplexy.

HEADACHE.—Indigestion, or deranged liver. Nervousness. Weakness. Overwork. From a common "cold." At regular times of the day, or on one side, in neuralgia. Fevers, and eruptive disorders. Rheumatism, and gout. Before a fit of apoplexy. Terribly severe in inflammation of the brain.

HEART, PALPITATION OF.—Common in indigestion. From any cause of weakness. Hysteria. Terror, or other emotion. From disease of the heart (comparatively rare).

PAIN.—Pain may be inflammatory, or arise from simple irritation. The former indicates a local mischief, which may be serious. The latter does not (except in case of accidents). Inflammatory pain is increased by

sure; irritative pain is rather relieved by it. (Hysteric pain is an exception to this rule.) Thus, the pain of inflammation of the bowels may be distinguished from that of colic, gravel, or gall-stones; but wind may cause tenderness, without inflammation, for an obvious mechanical reason. Whenever pain is dangerous, there is generally fever. For the causes of pain in the head, see *Headache*. Pain in the chest may arise from cold, consumption, inflammation of the lung or pleura, or rheumatism. Pain, deep-seated and continued, opposite the heart, liver, or kidney (loins), should attract attention to the organ. Pain in the joints may be caused by rheumatism, gout, scrofulous inflammation, phlebitis, or hysteria. Pain in the stomach, by wind, acidity, or inflammation (rare). Pains in the back and limbs usher in fever, scarlatina, and small-pox. Pains all over the body occur in influenza, or a common cold; also, in pregnancy, and hysteria. Pain in the face and other parts, if periodic and without inflammation, is neuralgic, and cured by quinine.

Pulse, Indications of.—It is to be remembered that the rate of the pulse varies with age. In a new-born infant there are about 130 beats in a minute; in a child 5 years old, 100; at 10 years old, 90; at 15, 80; at 20 and upwards, 72 on the average. In a person standing the pulse is quicker than when sitting, and quicker sitting than when lying down. The difference between standing and lying down will be generally 15 beats in a grown person. Exertion and excitement of any kind quicken the pulse, sometimes to a remarkable extent. In some per-

sons the pulse is habitually slow; in others, constantly fast. Within certain limits, this may happen without disease. When the pulse of a person, seemingly healthy, is always above 90, latent consumption or hysteria must be the cause. A sudden increase of pulse, with loss of appetite and other marked symptoms, constitutes fever, a sign of some severe inflammation, or of an epidemic poison in the blood. The pulse may then be from 100 to 150 or more; it is quickest in children.

An irregular pulse may occur in flatulence, exhaustion, apoplexy, or disease of the heart.

Differences in the strength and general character of the pulse are important in aiding the physician in his estimate of the state of the patient, but require much experience before they can be properly distinguished.

THROAT, SORE.—In a common "cold." In quinsy. Scarlatina (with fever and rash). Diphtheria (tenacious white membrane, great exhaustion, no rash). With swollen glands, in mumps. Ulcerated, in syphilis and consumption. With hoarseness, pain, fever, in laryngitis, and croup.

TONGUE, FURRED.—From indigestion, constipation, or disordered liver. Intemperance. In fevers and inflammations. In rheumatism and gout.

VOMITING.—Unwholesome food. Intemperance. Before the onset of eruptive fevers or other serious disease. In rupture, colic, diarrhœa, cholera, gravel. In inflammation of any organ within the belly. Hooping-cough. Poisoning (it should then be favoured).

SIMPLE MEDICINES

TO BE USED FOR THE COMMONER DISORDERS OF THE POOR.

Purgative powders for children.

Rhubarb (powdered),
Magnesia,
Bicarbonate of soda, of each a drachm.

Mix, and divide into twelve powders.

Purgative pills for adults.

Rhubarb,
Aloes,
Blue pill, of each a drachm.

Make into a mass with syrup, and divide into pills of the ordinary size. One for a dose, or two for robust persons.

Common tonic.

Sulphate of iron, 1 grain.
Dilute sulphuric acid, 5 drops.
Infusion of quassia-wood, 1½ oz.

This is for a dose. The medicine may be given twice or thrice daily for some time.

Ague medicine.

Quinine, 3 grains.
Dilute sulphuric acid, 3 drops.
Water, 1½ oz.

Every three hours, between the paroxysms. (This is also a good tonic, but more expensive than the last).

Fever medicine.

Nitric ether, ½ a drachm.
Nitrate of potash, 5 to 10 grains.
Water, 2 oz.

Every three or four hours. May also be given for colds, and rheumatic pains when not severe.

Diarrhœa medicine.

Tincture of rhubarb,
Tincture of ginger, each 1 drachm.
Chalk mixture, 1 oz.

To be taken every four hours while the diarrhœa continues. (Castor oil should be given at the first.)

Cough medicine.

Oxymel of squills, ½ dr.
Sweet spirit of nitre, ½ dr.
Antimonial wine, 10 drops.
Water, 1½ oz.

Every four hours while the cough is troublesome.

Antacid mixture.

Bicarbonate of soda,
Carbonate of magnesia, each 10 grains.
Tincture of opium, 5 drops.
Gum mucilage, ½ oz. Mix. Then add
Water, 1 oz.

For a dose. To be used in rheumatism, pain in the stomach, flatulence, &c. Not to be taken too often. (To children, give one-third of the dose, and leave out the opium).

Emetic, for poisoning.

A dessert-spoonful each of mustard-flour and salt, mixed with water. To be repeated at once, if it do not act.

Emetic for children.

As much ipecacuanha as will lie on a sixpence, mixed with a little water, to be given every ten minutes till it acts.

Ointment for old ulcers (and burns).

Chalk, 1 oz.
Lard, ½ oz.

Mix thoroughly, apply to the part, and then bandage it.

ACCIDENTS AND EMERGENCIES.

Bites, Venomous.

The bites of insects, wasps, bees, ants, &c., may be best cured by applying a little *sal volatile* to the spot, and then dusting it with flour or chalk. Bluestone, if at hand, forms a useful application. If a sting is perceived in the wound, it should be extracted with a fine needle.

The bites of serpents may prove rapidly fatal. The wound should be sucked with the mouth, the limb tied round tightly just above it, then rubbed with olive-oil. Brandy and ammonia must be given in frequent doses, if urgent symptoms come on.

Most dangerous of all bites is that of the mad dog. Here also the wound may be sucked, and the limb tied. But the only safety is found in destroying the part touched by the teeth. Caustic should be at once applied, or a red-hot iron, if the surgeon be not at hand. Fortunately, mad dogs are rare, and hydrophobia is so too. A

dog which has bitten any one should be secured and watched. If found not to be mad, there need be no alarm whatever.

Bleeding.

Bleeding from the nose is common ; it is rarely excessive or dangerous. If so, it may be stopped by plugging the nostril. Bleeding from leech-bites may be arrested by touching the spot with a stick of lunar caustic. Slight bleeding from a wound requires a pad of lint on the part, secured by a bandage. Arterial bleeding, in jerks of bright red blood, is dangerous. The limb should be bound with a handkerchief *above* the wound, a stick or roller be introduced beneath the handkerchief, and turned round until the pressure is so tight as to stop the hæmorrhage. If this be not done, the patient may die from loss of blood before the arrival of a surgeon. When the trunk or the head is wounded, firm pressure must be made over the spot with a sponge or pad, until the flow of blood is arrested. The application of ice or cold water will sometimes stop hæmorrhage. During internal hæmorrhage ice may be swallowed, and the patient kept recumbent and very quiet.

Bones, broken.

Pain, distortion, and the grating of the broken ends against each other, are proofs of a fracture. In particular cases it is difficult to distinguish it from dislocation, but the precautions to be taken are similar. The patient should be laid on a bed if one is at hand. Rest is required, and the limb should be kept as straight as pos-

sible until the surgeon arrives to adjust it. If the man has to be moved this must be done, if possible, without moving the broken limb. He should be carried on a door or shutter without jolting, except where the arm, collar bone, or rib is fractured, when he is generally able to walk.

Where the limb is crushed, or there is an open wound, wet lint should be applied, and a bandage wrapped round it at once. Concussion, or bleeding (which see), may have to be attended to.

BONES, DISLOCATED.

A bone is displaced by a strain or other violence at the place where it is jointed to another. Distórtion results, and loss of power in the limb. It may sometimes be replaced by forcible extension with a jerk. This must not be attempted if it causes much pain. If a dislocated joint is not quickly attended to by a surgeon it may be too late to return the bone, and permanent deformity will result.

BURNS.

For slight burns and scalds the application of wet lint, or dusting the part with flour, will be sufficient. In serious and extensive burns, the whole part injured should be at once wrapped in cotton wool, and a loose cloth used to retain it. Protection from pressure is required. In burns of the hands some wool must be kept between the fingers, or else they may grow together. After some time cold water dressing, or lint may be applied. A mixture of lime-water and linseed oil is a good applica-

tion. After a severe burn brandy should be given freely to maintain the vital powers. Opium will allay pain. Contraction of the skin may occur during healing, unless the part be continually moved and stretched.

Choking.

A hard mass of food, or fishbone, may stick in the throat of a child or grown person, and press on the windpipe so as to threaten suffocation. An attempt should be made to hook it up or push it down with the forefinger. Or the end may be gained by swallowing a piece of bread, which will force the impediment down in most cases.

Concussion, or shock.

This condition is similar to fainting, and is generally produced by a serious accident of any kind. The patient should be laid down, have plenty of fresh air allowed him, and take repeatedly small doses of wine or brandy and water, until the paleness and sickness have abated, and the pulse has recovered its force.

Drowning.

A person who has been in the water for a few minutes, may seem dead, but recover under proper treatment. The body should be laid on its face for a moment that the water may run out of the mouth, then carried into a warm room, stripped, laid in a warm blanket, and rubbed with warm dry cloths. If breathing should not at once begin, artificial respiration should be practised. This may be done by blowing through a tube adapted to the

patient's mouth (or with one's own mouth), getting a second person to close the nostrils with one hand, and make gentle pressure on the larynx with another. Pressure on the chest will cause the air to pass out again. The natural inspiration and expiration must be imitated in this way. It should be continued for a long time before hope is given up. (Dr. M. Hall's method consists in alternately turning the body half over, and back again, in proper time.) Wine or brandy may be given when the patient is able to take it.

FITS.

For a notice of the disorders which cause fits, see Index of Diseases. Fits of different kinds are easily distinguished. There may be fainting, hysterical, epileptic, or apoplectic fits. Fainting comes on more or less gradually; the person turns pale and staggers before he falls. The pulse is very weak. Unconsciousness seldom exists for long; exposure to fresh air, lying down, and having the face bathed with cold water, will soon restore the patient. In hysterical fits (in women), there is no unconsciousness at all; the woman does not fall, or falls so as not to hurt herself. The same simple treatment, with a free use of cold water, will restore her. In an epileptic fit there is a sudden fall, generally with a scream. The patient is unconscious, and convulsed. The collar, &c., about the neck must be loosed, the head raised, and the patient prevented from hurting himself. The fits must be expected to recur, and the patient will, therefore, require to be properly watched. An apoplectic fit may occur in a man past middle age. Generally he is of a

florid and corpulent tendency. Some headache and fulness of the head may precede the attack. There is no scream, and the fall is not so sudden as in epilepsy. The loss of consciousness is complete, but convulsions are rare. Raise the head and loosen the clothes, as in the other case. If the stupor is profound and long, apply ice to the head, and mustard poultices to the feet and calves. When consciousness returns, the patient may be found to be paralyzed.

HANGING, or STRANGULATION.

Loosen the cord or ligature. Lay the patient down, and resort, if necessary, to artificial respiration,—unless the body is cold, or the neck broken, when the case is hopeless.

POISONING.

The symptoms of poisoning occur suddenly in a person previously in good health, and follow soon after eating or drinking. When food has been poisoned all who have partaken of it may be expected to suffer in the same way. Directly poison is suspected an emetic should be given, of salt and mustard, or 20 grains of sulphate of zinc in water. Raw eggs and milk are the best antidotes in all cases of metallic poisoning. When vitriol, or a mineral acid has been taken, soda, chalk, or soap should be given as an antidote. In poisoning by prussic acid *sal volatile* should be administered immediately. When a vegetable poison has been taken, as opium, belladonna, aconite, or hemlock, an emetic should first be given; then, if it be at hand, give copious draughts

of finely powdered animal charcoal, mixed with water—as much as the patient can be got to swallow. The author was once the means of saving, by means of this simple remedy, the life of a man who had taken an enormous dose of nux vomica. (Powders and compounds used for killing vermin frequently contain this ingredient.) For some remarks on poisoning by opium, see opium in Index of Remedies. Brandy and ammonia may be given as restoratives during recovery from the exhaustive effects of poisons.

Thus, in cases of poisoning, what we have to attend to is as follows:—First, the emetic; then the antidote (raw eggs and milk for mineral, animal charcoal for vegetable poisons); lastly, restorative treatment during recovery.

WOUNDS.

These belong distinctly to the province of the surgeon. In a simple cut or incised wound, we have merely to bring the edges of skin together as correctly as possible, and secure them so by plaster or bandaging. Dressing with lint dipped in cold water, and kept in its place by a covering of oiled silk, will promote the healing of most simple wounds. A contused wound, or bruise, may be bathed with warm water, or decoction of poppies, to allay pain.

In an extensive or serious wound the part must be kept at rest until the surgeon can arrive, displaced pieces of skin, flesh, or bones being restored as much as possible to their natural position, and immediate precautions taken against danger from bleeding (see *Bleeding*). The raw or wounded surface should be covered with wet lint, so as

to protect and soothe it, and the whole lightly wrapped in a thin cloth or handkerchief, or in oiled silk if it can be obtained. The risk of dangerous inflammation will be, to some extent, warded off by this proceeding. Even in deep wounds of the chest or abdomen by knives or bullets, likely to prove fatal, no better or safer advice can be given than this.

THE END.

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